THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES PUBLIC HEALTH SERVICE

CENTERS FOR DISEASE CONTROL AND PREVENTION NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

convenes the

WORKING GROUP MEETING

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

NEVADA TEST SITE

The verbatim transcript of the Working

Group Meeting of the Advisory Board on Radiation and

Worker Health held in Erlanger, Kentucky on

November 15, 2006.

<u>C O N T E N T S</u> November 15, 2006

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TRANSCRIPT LEGEND

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- -- "*" denotes a spelling based on phonetics, without reference available.
- -- (inaudible) / (unintelligible) signifies speaker failure, usually failure to use a microphone.

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PROCEEDINGS

1 (9:00 a.m.)

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WELCOME AND OPENING COMMENTS

DR. LEWIS WADE, DFO

MR. PRESLEY: Lew, you want to call us to order and...

DR. WADE: Okay, sure. This is Lew Wade and I have the pleasure of serving as the Designated Federal Official for the Advisory Board, and I'd like to call to order this meeting of the -- the working group of the Board. This working group is focused on issues related to the Nevada Test Site site profile, and it's chaired by Robert Presley, with Brad Clawson, Wanda Munn and Gen Roessler as members. And all of those individuals are here at the table. By way of background, there was some discussion earlier in the week as to whether we should hold this meeting or not, and in my role I suggested that we -- we go forward with the meeting. I don't know that we have a full day; I don't know that we don't, but I think that this is a very important process to keep going. One of the things that sort of caused me to

think that having the meeting was in order is that out of this Nevada Test Site workgroup there have come some very important issues that have been sort of designated as more generic issues above the test site itself, and I think we need to keep those issues focused, and I think Jim Neton is here to talk to us today about some of those generic issues. And while it might not be the responsibility only of this workgroup, I do think that this workgroup is where those ideas started to come forward. And I think we need to talk about them here and then I think the Board needs to decide possibly who would have the responsibility of tracking them, but I think it is a terribly important issue. So again, I thank all of you who have made the

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So again, I thank all of you who have made the trip. I know it's difficult and arduous, and this has been a difficult two weeks with Board meetings and there's a subcommittee meeting tomorrow, and another working group meeting on Friday. So I appreciate all of your efforts and your willingness to serve, and I particularly thank Robert for being here and leading us. So Robert, it's all yours.

1	MR. PRESLEY: Okay. Do you want to go through
2	and say who's here?
3	DR. WADE: Yeah, I'm sorry, we should do that.
4	Let's go around the table and say who's here,
5	and then we'll do the phone line. This is Lew
6	Wade and I work for NIOSH.
7	MR. CLAWSON: I'm Brad Clawson. I'm on the
8	Advisory Board.
9	MS. HOWELL: This is Emily Howell. I work for
10	HHS.
11	DR. BEHLING: Hans Behling, SC&A.
12	DR. NETON: Jim Neton, NIOSH.
13	MR. ROLFES: Mark Rolfes, NIOSH.
14	MR. PRESLEY: Robert Presley, Board member.
15	DR. ROESSLER: Gen Roessler, Board member.
16	MS. MUNN: Wanda Munn, Board.
17	DR. WADE: Now let's have those on the phone
18	identify themselves. We'll start with members
19	of the NIOSH or ORAU team. Anyone else out
20	there?
21	MR. ROLLINS: This is Gene Rollins. I'm with
22	the ORAU team, DMA, subcontractor.
23	DR. WADE: We appreciate your being here, Gene.
24	I know this is a busy day in your life, I
25	think, and we appreciate your being here.
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1	MR. SMITH: My name is Billy Smith. I'm with
2	Chew and Associates.
3	DR. WADE: Okay. Other members
4	MS. SMITH: My name is Cheryl Smith, Dade
5	Moeller and Associates.
6	MR. KUBIAK: My name is Mike Kubiak. I'm with
7	the SEC group on the ORAU team. I'm conflicted
8	with NTS due to my MGW for our corporate.
9	DR. WADE: Thank you. Other members of the
10	NIOSH/ORAU extended family?
11	(No responses)
12	SC&A team?
13	DR. MAKHIJANI: This is Arjun Makhijani.
14	DR. WADE: Thank you for joining us, Arjun.
15	We're better when you're with us.
16	DR. MAKHIJANI: Yeah, sorry I couldn't be
17	there.
18	DR. WADE: I understand. Other SC&A members?
19	(No responses)
20	Other federal employees who are on this call as
21	part of their employment?
22	MR. STAUDT: This is David Staudt with the CDC.
23	DR. WADE: Welcome, David.
24	MR. KOTSCH: Jeff Kotsch with the Department of
25	Labor.

1	DR. WADE: Welcome, Jeff.
2	MS. SHIELDS: LaShawn Shields, NIOSH.
3	DR. WADE: Good morning, LaShawn. Other
4	federal employees who are here by virtue of
5	their employment?
6	(No responses)
7	Any members of Congress, representatives of
8	those members or representatives of claimants
9	or petitioners who would like to identify
10	themselves?
11	(No responses)
12	Are there other Board members on the call,
13	other than the four that are with us here in
14	the room?
15	(No responses)
16	Good, we don't have a quorum. I guess I would
17	like to go back and have members of the the
18	NIOSH/ORAU extended team and then the SC&A team
19	identify any conflicts that they might have, so
20	let's start with the folks here. Jim?
21	DR. NETON: Jim Neton, and I don't believe I
22	have any conflicts at NTS.
23	MR. ROLFES: Mark Rolfes, I have no conflicts.
24	MR. PRESLEY: Robert Presley, I have no
25	conflicts.

1	DR. ROESSLER: Gen Roessler, no conflicts.
2	MS. MUNN: Wanda Munn, no conflicts.
3	DR. WADE: Lew Wade, no knowledge, therefore no
4	conflicts.
5	(UNINTELLIGIBLE): (Unintelligible), no
6	conflicts.
7	MR. SMITH: Billy Smith, I have a conflict.
8	DR. BEHLING: Hans Behling, no conflicts.
9	MS. SMITH: Cheryl Smith, no conflicts.
10	MR. ROLLINS: Gene Rollins, no conflicts.
11	DR. MAKHIJANI: Arjun Makhijani, no conflicts.
12	DR. WADE: Anyone else who needs to make that
13	confession of the soul?
14	MR. KUBIAK: No well, Michael Kubiak again.
15	I have a conflict through (unintelligible) MGW
16	Corporation.
17	DR. WADE: Would you say that again, please?
18	MR. KUBIAK: Michael Kubiak. I have a
19	corporate conflict due to employment with MGW
20	Corporation.
21	DR. WADE: Thank you. Anyone else?
22	(No responses)
23	Again, I would ask all of you on the phone to
24	practice good phone etiquette and mute if
25	you're not speaking. And Robert, I think now

1 I've done my job. 2 MR. PRESLEY: All right. What I thought we 3 would do today is start through the comments, and I'm going to read them off and if anybody's 4 5 got any responses, we're going to stop at the 6 (unintelligible). 7 Is that all right? If we have actions or if 8 the response has changed or if Mark has 9 something -- I want to thank you for this 10 update spreadsheet very much. 11 MR. ROLFES: Thank you, Bob. 12 MR. PRESLEY: Very, very much. Has anybody got 13 a problem with that? We'll go right through 14 these things and try to --MS. MUNN: 15 No. 16 MR. PRESLEY: And then once we get through 17 them, Jim, do you want to talk about the 18 overriding issues all at once or do you want to 19 20 No, I think they sort of DR. NETON: 21 (unintelligible) --22 MR. PRESLEY: -- as we go through -- do them 23 one at a time as we go through? 24 MS. MUNN: Yeah. 25 They'll self-identify themselves in DR. NETON:

1	the comments and, where necessary, I can speak.
2	MR. ROLFES: Bob, before we begin, could I
3	check with Gene Rollins on the phone to see
4	on his availability? Gene?
5	MR. ROLLINS: Yes, I'm going to have to leave
6	you about ten minutes before 10:00, and but
7	I should be back on the phone call within 45
8	minutes to an hour.
9	MR. ROLFES: Okay. If it's all right with the
10	Board, I wondered if we could discuss some of
11	the issues that we have Gene Rollins down for
12	the assignment.
13	MR. PRESLEY: I think that
14	MR. ROLFES: Okay.
15	MR. PRESLEY: that'd be great. That'll be
16	good.
17	MS. MUNN: Gene, is that ten till your 10:00 or
18	ten till our 10:00, or is it all the same
19	10:00?
20	MR. ROLLINS: Oh, I think we're all on Eastern
21	Time, I believe.
22	MS. MUNN: Okay.
23	MR. PRESLEY: He's on Eastern Time.
24	MR. ROLFES: Okay. Well
25	MR. PRESLEY: I'm going to let you since you

1 know which ones that he's been working on, I'll 2 let you start it. 3 MR. ROLFES: I think -- okay, Gene, I don't know if you want to go ahead and take the first 5 item that -- are still working on. 6 discussed the resuspension issue as one of the 7 major issues. 8 MR. ROLLINS: As I -- as I mentioned to you 9 days ago, I think that issue is going to 10 require a good bit of discussion. Hopefully we 11 can -- we can get some input from -- from 12 everyone on -- on that subject, and it might 13 take longer than 45 minutes to do that, so I 14 would -- I would recommend maybe that we put 15 that off until later so we can give it the full 16 discussion that it needs. 17 MR. ROLFES: Okay. 18 Now Mark, I -- I presume that MR. ROLLINS: 19 everybody has this matrix that was provided to 20 us on Friday, this updated matrix. Is that 21 what we're working from? 22 MR. ROLFES: Yes, I believe so. 23 **UNIDENTIFIED:** Do you have an extra copy? 24 MR. ROLFES: I do not have an extra copy. 25 DR. ROESSLER: You know what, I think -- let me

1 just make sure, I think I have it on my 2 computer and then you can have my --3 MR. PRESLEY: Can you -- can you download it 4 off my stick? 5 UNIDENTIFIED: Yes. 6 DR. NETON: Should be able to. 7 MR. PRESLEY: Can you get a copy off my stick? 8 MR. CLAWSON: Yeah -- well, I'll borrow hers. 9 Let's go ahead and go (unintelligible) --10 DR. WADE: Does anyone else need a hard --11 DR. BEHLING: Yeah, I would --12 DR. WADE: Okay, I will -- here, you take --13 MR. ROLLINS: What we have tried to do with 14 this matrix is to -- is to shade the items that we feel like we have resolution on. 15 16 items that are not shaded are the ones that we 17 need to discuss in a little more detail. 18 RADIONUCLIDES 19 And so starting with comment one on page 1 of 20 26, that had to do with some tables of 21 radionuclides that were deemed as not being 22 complete, and we agreed and said that we would 23 add those radionuclides. 24 And frankly, I don't know why that particular

item is not shaded, but I don't think we need

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1 any further action on that. Does -- do we have 2 general agreement on that one? 3 MS. MUNN: It's my understanding at our last meeting that we did. My -- my only question 4 5 was where are we with the Chapter 5 revision. Are we actually there, or is that still in 6 7 process? 8 That's still in process. MR. ROLFES: 9 believe ORAU has been working on it. I do not 10 believe we've received an official copy of the 11 revision yet for review. Is that correct, 12 Gene? 13 MR. ROLLINS: Right. They -- they -- they're 14 all coming up for two-year review and decided to put that review off a little bit until we 15 16 could get some resolution from this working 17 group as to what changes needed to be made so 18 we wouldn't have to go back and revise again. 19 But that -- that revision is imminent. 20 MS. MUNN: So my -- my understanding is 21 correct, we did come to a reasonable consensus 22 at our last meeting. Right? So you --23 MR. ROLLINS: Correct. 24 MS. MUNN: So it's just a question of process 25 here, not a question of issue.

1	MR. ROLLINS: Correct.
2	MS. MUNN: Thank you.
3	DR. MAKHIJANI: This is Arjun. Ms. Munn,
4	that's quite right.
5	MS. MUNN: Thank you, Arjun. Arjun, as long as
6	you're on the phone, are you going to be at the
7	hearing today?
8	DR. MAKHIJANI: Yes, I intend to be.
9	MS. MUNN: Oh, good. I'd be interested in your
10	in your feedback after that's over.
11	DR. MAKHIJANI: I'd be happy to give it to you.
12	MS. MUNN: Thank you.
13	MR. ROLLINS: Moving on, response responses
14	1(b), 1(c) and 1(d), which 1 delta I show
15	them as all being resolved. You might want to
16	just look over those for a minute and to
17	make sure that we're on the same page there.
18	MR. PRESLEY: That's what I show, Gene. This
19	is Bob Presley.
20	MR. ROLLINS: Okay. Thank you, Bob.
21	DR. MAKHIJANI: Right, I agree also.
22	REACTOR TEST RE-ENTRY
23	MR. ROLLINS: And then comment two had to do
24	with providing guidance for dose estimation for
25	gonad, skin and GI tract for reactor test re-

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entry, including considerations for large hot particle doses to the skin and the GI tract, and to take into consideration the methodology outlined in the NRDL document. We agreed that that would be appropriate, and after we have a chance to look through that, and I think that's -- we recently brought on Billy Smith to help us with that -- with that consideration. don't think he's had -- I'm -- I'm not going to put him on the spot because he hasn't been looking at it for very long, but we will take those methods into consideration and, as appropriate, we will revise the TBD to provide the guidance to incorporate those methods. Right. This is Jim Neton. DR. NETON: gotten into this as of -- as of the last couple days, and I've taken a look at the NRDL document and I think we need to be careful -and it's alluded to later on in one of the responses -- about wholesale adaptation of the values that are in there, principally because that document was written in 1968 and it was their early attempt at trying to do some dosimetry for these large hot particles; that those methods have been largely superseded by

I just --

1 some of the new ICRP models -- the ICRP-66-1 2 model and GI tract model -- which I believe was 3 around in that time period, but how it's applied and linked to this -- linked to the 4 5 respiratory model is -- is unique now. 6 I don't know that, outside of the source term 7 evaluation that's in this document, there's 8 going to be a whole lot of extra usefulness as 9 far as quidance on how to actually calculate 10 the dose from these hot particles. 11 MR. ROLLINS: Jim, this is Gene Rollins. 12 You're -- you're exactly right, and that's why 13 I -- I put the qualifier in, as appropriate. 14 But there are -- there are some things in there I believe that could be of value, as you said, 15 16 such as the source term estimations. 17 Well, there -- there appear to be DR. NETON: 18 some -- some pretty decent particle size 19 distribution measurements and -- where they 20 show that there's some fairly large particles. 21 You know, as far as ingestion doses from hot 22 particles, that gets into an area where we may 23 have some complex-wide overarching issues. 24 appeared to me in a quick look at this document 25 that what they were really trying to do was to

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calculate the GI tract dose from the inhaled and subsequently swallowed particles. I don't -- I don't think this is a de novo look at just ingestion of the particles, you know, off of the ground or anything. And in that case, I think the ICRP-66-1 model somewhat supersedes that -- that calculation and in fact that the doses would primarily be more relevant to the nasal/pharynx region, what's called the ET-1 and ET-2 region of the -- of the GI -- of the respiratory tract. And I don't think that would be a change in -- a paradigm change in our way of doing business. We would just buy the ICRP models and use the appropriate particle size distribution that we could glean from this document. So I think that's fairly straightforward and I think it's indicated here we're committed to doing that, but I just wanted to sort of let people know that by and large the dosimetry done in here would not necessarily be relevant to our dose reconstructions.

DR. MAKHIJANI: This is Arjun. We raised the issue, not -- you know, not in the idea that NIOSH would be adopting the dose numbers, but

as -- as an issue where hot particles appear to be important. There were measurements of these particles and there was a source term that was not covered in the site profile, and so the issue in our review was raised for NIOSH to evaluate it, and I don't believe we've made the suggestion that NIOSH should adopt the -- adopt the dose numbers, so -- so I support what -- what you just said, Jim --

DR. NETON: Exactly, I --

DR. MAKHIJANI: -- that obviously we're committed and you're committed by the regulation to using the most recent model, so the -- and I do agree also that the source term as well as the particle size measurements are probably the most useful part.

I have a question about your statement that it is basically via -- ingestion via inhalation. I think the kinds of particle sizes that were talked about in -- in the Naval Radiological Defense Lab document are non-respirable particle sizes, and a lot of the discussion in there -- if I remember it correctly, I haven't looked at it in a while -- is about non-respirable particles, so I don't -- I don't

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think that it would be covered by resp-respirable particles alone.

DR. NETON: Well, I think it would, Arjun. did a quick look at this and I could be off base, but my -- my quick read of this was that they're really looking at particles that -that lodged in the upper airways. And those are, by definition, non-respirable. get stuck in the -- in the head, you know, the upper airway region, and then would be swallowed. By non-respirable, they're not deposited in the deep lung. So I didn't see any indication in here of just sort of a source term where they calculated ingestion of material from the surface itself due to the picking up of the material on your hands or -or from your face. It could be in there, maybe I missed it. But --

DR. MAKHIJANI: No, no, I agree with that. No, I don't -- I don't think it's in there, although mine is from longer ago than yours.

DR. NETON: No, I think -- I think this does raise some complex-wide issues. I noted in the matrix that there were -- was some disagreement whether this was complex-wide or not. I think

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-- I think the general issue of hot particles certainly is a complex-wide issue where it -where it might exist. In fact, we don't -- we have not really done much in the area of hot particles because many of our facilities we didn't feel was -- was necessary to account for that. But in the area of skin contamination -and this document, by the way, predated Varskin, too -- we don't see any real change necessary. If we -- you know, we would use Varskin for skin contamination dosimetry, and I think the smallest area of skin as documented by most bodies -- including the NCRP, NRC, DOE -- would be one square centimeter of skin to calculate the dose averaged over. And in doing so, our models easily account for that. just a matter of identifying the existence of a hot particle on that particular portion of skin.

It brings up an interesting issue, though, and this sort of falls into the real overarching area, is even if you are capable of calculating a dose to one square centimeter of skin from a hot particle -- say for a beta emitter -- how relevant is the risk model that we use to -- to

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that dose value, because you know the risk models were based on essentially parallel beam whole body exposures, to a large extent, and there's been a lot of experiments that tend to indicate both directions, either the risk is higher or lower, by irradiating a small area. Many areas of research have indicated that the actual do-- the risk is lower if you concentrate the area into one small particle, very analogous to an alpha irradiation where there is a smaller number of cells affected and that many of the cells will be killed through this process, so with no killing, then the risk of cancer will bound because dead cells can't be cancer cells. So there's some investigation we need to do in that area to see the applicability of the risk models to the hot particle dosimetry, but the physical calculation itself we believe we have covered using the Varskin calculation limiting the area to one square centimeter, where necessary. course the trick is to identify those situations. In this NDRL -- NRDL document there are some good indications of how prevalent these hot particles may be and what -

1 - what -- what we might be able to use to 2 calculate the dose. 3 DR. ROESSLER: So to update this -- this is Gen 4 -- table then where we have two conflicting 5 things, one is that it is a complex-wide issue and one column says -- and it's probably Gene 6 7 Rollins -- that it's not. I think you're 8 saying that it is. 9 DR. NETON: Well, I think hot particles in 10 general are complex-wide issues and we need to 11 -- I don't say that we're mishandling them, but 12 I think we -- we need to develop some -- some 13 direct guidance on -- on handling them. 14 think that would be useful. 15 DR. MAKHIJANI: Could -- could I ask a question 16 about what is happening in regard to the dose 17 reconstructions that are being done like for 18 tunnel re-entry and other -- I mean have you 19 found this relevant for other than reactor 20 workers. And if so, what -- what is happening 21 with the dose reconstructions on this? 22 DR. NETON: I can't answer that question, 23 Arjun. I don't know if Mark can --24 MR. ROLFES: Gene, have we seen any cases where 25 we've noted that a person was contaminated with 1 a hot particle?

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MR. ROLLINS: Cheryl, I hate to put you -- I personally have not -- I'm going to let Cheryl speak in just a minute, but from my -- my own experience in doing a limited number of NTS dose reconstructions, typically hot particles would not be associated with cancers except those that are affected by non-penetrating radiation, such as skin and breast. typically what we have done and what I -- what I typically have done at Hanford doing dose reconstructions there is that we go through the records to see if there's any evidence that an individual was contaminated, and then we look at the areas in which the contamination was identified and we compare that to the particular cancer of interest to see if there's -- if there's a link-up. And if there is, what we have done in the past is employ the Varskin code to calculate what the potential dose to that -- to that can-- cancer location might have been.

Now I'm going to let Cheryl speak to her experience 'cause she's probably done a few more of these at NTS than I have.

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MS. SMITH: For the most part it hasn't -- has not been an issue because we're provided those records that indicate the other monitoring. Ιf we have them -- okay? -- you can -- you can figure out where they made their entry. frankly, contamination incidents -- you know, people will talk about them in their CATI, but we don't have enough specifics, we don't have -- I know I've seen at Rocky Flats some reports saying well, a person has been -- and -- and I think Hanford has these reports where, you know, they'll indicate where the person was contaminated, and there'll be a report included in the DOE files. But we've never seen anything like that. Now whether they actually did that -- and maybe Billy would be better able to speak to that -- kept files like that in individuals' case folders, I don't know. have not seen it at this point in any of the cases that I've worked.

MS. MUNN: Arjun, this is Wanda. If I understood your question correctly, my memory from other working groups is that you personally have brought this issue up on other occasions, have you not? On other sites?

1	DR. MAKHIJANI: The dose reconstruction issue?
2	No, Ms
3	MS. MUNN: No, the hot particle theory, have
4	you not
5	DR. MAKHIJANI: Yes, it's in our review.
6	MS. MUNN: Yes, but but I I guess I was
7	misunderstanding your question. I I thought
8	we were questioning whether this was an NTS
9	issue or whether this was a more generic issue.
10	I thought that was the topic of discussion.
11	Was I am I off base? Isn't that where we
12	started?
13	DR. NETON: Well, I mean I would agree that we
14	need to have more specific guidance to our dose
15	reconstructors on how to deal with hot
16	particles.
17	MS. MUNN: Yeah, and and that's what and
18	and I I guess I misunderstood what
19	Arjun's question was then.
20	DR. MAKHIJANI: Yeah, yeah, because, you know,
21	just I was just taking off from what Jim
22	just said, Ms. Munn, that if there is specific
23	guidance that that's lacking, what happens
24	right now if this problem occurs in a dose
25	reconstruction.

MS. SMITH: Yes, I guess --

DR. MAKH

DR. MAKHIJANI: How do they do it now?

MS. SMITH: -- we can say that -- we've been pretty careful about -- because it's still kind of up in the air how to handle all of the skin cancer issues -- the beta/gamma ratios, you know, how we're going to apply those -- we've tried to keep those -- keep those cases -- not work those cases until we are -- do have a clear path forward.

DR. MAKHIJANI: Now, okay.

DR. NETON: But this gets into the area, though, where, you know, you -- you're not likely to have hot particle dosimetry -- or measurements on many of these people, particularly in the early days, so then what -- what do you do? Is it -- since you can't prove a negative, do you default and everybody has hot particles or do you go with the weight of the evidence that it's not likely, and there's some good -- good analyses in this NRDL document I think that can be applied just to sort of get a handle around the frequency of these hot particle events in a specific situation. I mean it's just got to be -- it's

1 case-specific, you know, the existence of these 2 hot particles. But how you deal with that when 3 they are there, I think we need to have a 4 little better -- better quidance. MR. CLAWSON: Well, Jim, this is Brad. 5 6 would -- where would you say these hot particles are more prevalent or -- or are they 7 8 a complex-wide issue or just NTS? 9 DR. NETON: No, not just -- they're -- they're 10 around. I mean it -- you've got to have -- for 11 hot particles to be -- you've got to have some 12 kind of -- more likely a reactor or something 13 of that nature where you -- you've had a 14 particulate, you know, fission products 15 (unintelligible) activation products 16 (unintelligible) --17 MR. PRESLEY: Or a -- or an accident. 18 DR. BEHLING: Were there any kind --19 detonations that turned out to be a dud? 20 know that, for instance, in the Marshall 21 Islands there were several detonations where 22 the primary explosion took place but the 23 fission product never did, and there were large 24 amounts of plutonium fragments scattered all 25 over the test site which are then potentially

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hot particles. Were there any such incidents at NTS where you had a test that didn't -- it turned out to be a dud but the material exploded from -- from the primary charge and it scattered hot particles? One particular case that I'm very familiar with in Marshall Islands was (unintelligible) plutonium device was -- was detonated and scattered a large amount of large particles, plutonium particles, throughout the area. Was there a potential to that at NTS?

MR. ROLFES: Gene or Billy, could you comment on that? I know that there were some plutonium dispersion tests at Nevada Test Site. wondered if we could elaborate on that. believe I spoke with Martha DeMarre about one of those instances where they did achieve criticality during one of those tests. have any indication of a person being exposed to large particles of plutonium that could have contained fission and activation products? This is Gene Rollins. They did a MR. ROLLINS: series of safety tests where they were trying to determine whether or not the -- with the safety zone whether or not a device would go

critical, it would -- just on the high -- high explosives, but I'm going to let Billy speak to that because he has far more experience in that area than I do.

MR. SMITH: This is Billy. My experience is that there were some safety tests conducted at NTS, but I don't know of any incident where there were people exposed to hot particles as a result of those safety tests. Most of the safety tests that I'm aware of -- and my experience goes back to 1966 -- were conducted underground, and you know, safety tests were generally low -- very low yield tests. Most of them did not go nuclear anyway. And this was, as Gene has just indicated, a test to see whether or not you could make the thing go nuclear with the HE that was wrapped around the pit.

Before I comment further I'd like to make a comment about the NRDL report. This -- this report I think tends to try and -- and -- well, the comments that are in the matrix tend to indicate that the model may fit the NTS environment, and it seems to me that, given how the NERVA project worked over at Area 400 where

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they tested the nuclear rocket engines, hence passing hydrogen gas through the hot cores to accelerate it out through the nozzles, the hot particles that came out as a result of that would have been suspended up into the atmosphere and the distribution and isotope types that were created during that process were significantly different from the fission products that are created during a nuclear test. And from nuclear tests -- that were underground, anyway -- where some activity may have been released to the environment would have been scrubbed by the overfill that was above the detonation zone that a lot of these particles would not have gotten out into the environment, particularly the heavier particles, the transuranic particles. would get the volatiles coming out of the hole, and they would be carried to the wind and the daughter products would be distributed along the downwind patterns. But in terms of the reentries, the tunnel re-entries or the vertical shot hole re-entries, these people were not necessarily exposed to any hot particles that -- that would have been created by any means.

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Does the silence mean I was cut off?

MS. MUNN: No, no, it doesn't. It means we're lost in thought here.

MR. SMITH: Oh, okay.

MS. MUNN: So to recap, if I understand correctly, I'm led to believe that Jim's earlier statement was quite accurate. These types of cases will have to be reviewed on a case-by-case basis rather than on a wholesale approach, based on the type of incident that was involved and based on the -- the location of the individual, and will have to do what I think we're probably charged with doing, which is depend upon the weight of the data to define the approach. Is that a reasonable summation?

MR. SMITH: Yes. I -- now Ms. Munn, I think -- I think the hot particle issue is a complex-wide issue.

MS. MUNN: Yes, we understand that.

MR. SMITH: The -- the -- and I think in terms of the NTS exposures, it's -- it's -- it's probably lower down the priority chain than other sites where hot particles may be more prevalent. We -- we did not experience hot particle exposures at NTS to any significant

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degree at all. As a matter of fact, I don't know of any dose reconstructions that -- that -- that have been looked at so far that have involved concerns with hot particle exposures.

MS. MUNN: Yeah, and this will be true of a number of other sites, as well. Yeah. Thank you.

I do have a question. DR. BEHLING: that hot particles existed is probably something that doesn't require much of a debate, but the question of how do you apply any kind of dose model, especially when you talk about a -- a hot particle that, as Jim Neton had talked about, is a non-respirable particle that starts out somewhere in the upper respiratory tract, gets passed from there into your GI tract and therefore exposes everything from the head back to -- to -- to the point of the colon and rectum. How do you -- how do you anticipate modeling such a -- an exposure? Well, I think the 66-1 model can DR. NETON: handle particles that are deposited in the nasal/pharynx region. It handles larger particles. And I think we would use standard -- standard dosimetry for that. I -- I've

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looked at NCRP Report 130 that was written in 1999 that -- that dealt with this exact issue on ingestion of hot particles, skin contamination -- the whole hot particle issue. And their basic recommendation was unless you can show that there is some (unintelligible) transit time of the hot particle through the GI tract, to treat it just as a insoluble -- any other insoluble particle as it moves through. The ICRP models for calculating dose to the GI tract -- I won't say they're pretty crude, but they're pretty simple. It's essentially onehalf the dose of the contents of that particular portion of an organ, and to try to pretend that we could modify that any finer and increase the dose based on some other principle would be beyond what we're certainly capable of doing, and would be -- we'd be consistent using their quidance, which says use the standard models. So I think it can be handled with the new -- with the ICRP-66 dosimetry model. don't -- I don't see that as a -- as a roadblock. The trick there, though, is to identify the existence of the hot particle. See, like in this NRDL report, the key

1 information here is that -- it categorized it, 2 you know, what -- what percentage and what 3 (unintelligible) they have. I don't know that 4 we're likely to -- how would you know that at 5 these sites, and then that becomes a little 6 problematic. How do you --7 MR. PRESLEY: Well, I was going to say, you 8 can't -- how do you do that? 9 DR. NETON: Well, it gets into the classic 10 situation of how do you prove a negative. How 11 do you prove the hot particles didn't exist? 12 MR. PRESLEY: Yeah. DR. NETON: And I'm not sure. 13 That -- that's 14 something that we need to try -- we need to 15 address, though. 16 DR. MAKHIJANI: This is Arjun. It may be that, 17 you know, indirect evidence might help 18 establish that. I -- I -- Ms. -- Billy Smith 19 made a pretty categorical statement there that 20 no one was exposed, or something close to it, 21 to hot particles. Whereas I think the early tunnel re-entry workers, for instance, who got 22 23 extremely high tritium doses and there were accidental -- there were -- there were mishaps 24 25 in those tunnels in the early days that I think

do bear some looking into. Now they -- I understand it's covered by an SEC, but because of the nature of the test site work being very episodic in relation to high radiation environments, it does concern the 250-day issue, and so it might be relevant. It may also be relevant for later tunnel re-entries in the -- in the '60s. So -- so I -- I -- I'm not talking about re-entries when there were no mishaps and when things went as anticipated.

But -- but it wasn't error-free.

MS. MUNN: No. But Arjun, again, we're back to the -- to the matter of needing to rely on the data itself, the preponderance of evidence, rather than potential scenarios.

DR. MAKHIJANI: Oh -- oh, Ms. Munn, no, I
wasn't -- I wasn't talking about creating
speculative scenarios. On the contrary. I was
just actually agreeing with -- with Jim Neton
that, you know, it -- it's difficult to prove a
negative and suggesting that there are
documented incidents where it may be possible
that there were hot particles, and looking at
those -- that incident data, it may be possible
to determine that. I -- I have always been

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uncomfortable relying on CATIs for these kinds of things because for the most part survivors don't know any of this, but -- but I think the incident data might help. So I'm just kind of trying to -- trying to suggest ways in which the speculation might be reduced, at least. MR. CLAWSON: Well, this is Brad. Wouldn't some of these hot particles be suspended, like the PLUTO test of that reactor, and ROVER? know, in our tour down there and stuff like that, they had people that were -- couldn't come out of their buildings till after they'd been cleaned up afterwards. You've got the cleanup peop -- don't they have any data on -on any of this, because you know, John was even saying that they couldn't come out of their trailers till after everything had been hosed down and cleaned up.

DR. NETON: I think that's what Arjun's suggesting is we would look at the existing reports that are out there related to the incidents, either planned or unplanned, and try to help bracket the universe of potential hot particle scenarios, where they -- where they more likely could exist, where they likely did

1	not exist. Like I suggested earlier, several
2	weight-of-the-evidence approaches is all we've
3	got to go on, and I think I can't argue that
4	we shouldn't do that. I mean I think we need
5	to do that.
6	MR. PRESLEY: Can we put something in here that
7	says that if that's going to be done on a
8	case-by-case basis then for the hot particles,
9	and let's get on with this?
10	DR. NETON: I but I'm not going to say every
11	single case by case, but
12	MR. PRESLEY: Where you've got where you
13	know that there is a known incident
14	DR. NETON: Right, yeah, that's I would
15	agree with that. We would evaluate on a
16	general basis we would evaluate the incidents
17	as applicable to the existence of hot
18	particles.
19	MR. PRESLEY: Right. Right.
20	DR. NETON: I think that's fair that's
21	reasonable.
22	MR. ROLFES: We already have done some cases
23	using Varskin in some of our dose
24	reconstructions when we have contamination
25	incidents. I can't remember the site

specifically, but I do remember seeing a dose reconstruction where some Varskin calculations 3 had been done because a hot particle was deposited I believe right inside the 5 gentleman's nose. 6 Well, I do think this reactor DR. NETON: 7 experiment here, as -- as Billy Smith pointed 8 out, is one of those unique scenarios that has 9 been identified. It was pretty easy and it was 10 studied well. Now the question is are there any other similar things out there that we need

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MR. SMITH: This is Billy. I have a question, and -- and particularly coming from me, it's -it's sort of a -- my experience at NTS started in 1966 and -- but I was on the weapons test I spent an awful lot of time over at Area 400 in 1966 to '68 working on another type of experiment with Project HENRY. But my question is, are the Pan Am records -- has anybody seen any Pan Am records that may have indicated that there were hot particles exposures to people from the NERVA experiments? MR. ROLLINS: This is Gene Rollins. I haven't -- I haven't seen any indication of that.

to look at, identify (unintelligible).

MR. SMITH: I -- I can probably check with

Martha sometime soon -- Martha DeMarre over at

the archives, NTS archives, and see if there

are any NTS records that include any of the Pan

Am exposures.

Now they did wear the NTS dosimeters, the external dosimeters, at that time. I'm positive of that because I wore those when I was there. But I'm not sure about any contamination records that Pan Am may -- was responsible for keeping at that time, what happened to those.

DR. MAKHIJANI: Yeah, we also suggested a look at the NRDL records, the Naval Radiological Defense Lab records. There are a number of references in that document that we've all looked at now, and they might be helpful -- because the hot particle issue will remain for the reactor -- or re-entry workers, and they might be helpful in -- in sort of giving some idea of who was exposed and when and at which tests and so on.

MR. PRESLEY: Okay. Is that -- go ahead, Wanda.

MS. MUNN: How large a task is that?

1 MR. ROLFES: I'm sorry? 2 MS. MUNN: Do we have a feel for it? 3 just asking how large a task it would be. I would ask Gene and his crew DR. NETON: 5 whether --6 To look at the Pan Am and -- and MS. MUNN: 7 again, look at the NRDL records as -- as 8 indicators of where one might even have this 9 concern, in an effort to try to put it to bed 10 as to when -- when we do or do not need to 11 incorporate that into our thinking. 12 MR. ROLFES: Billy, do you have a feel for how 13 long this might take to speak with Martha and 14 go through some of these records to determine 15 whether hot particle exposure could have been 16 significant for any of the reactor tests? 17 MR. SMITH: I would say it would probably take 18 -- take at least a week to -- you know, to get 19 any indication at all after we get Martha's 20 schedule adjusted to when she could start 21 putting that kind of effort into looking at 22 those records. 23 But now, you know, the -- the Area 400, which 24 was the area where these tests were conducted, 25 were a rather small subset of the NTS

1	population, so we're really not talking about a
2	lot of people relative to the numbers of people
3	that worked at NTS. So when you talk about NTS
4	and these rocket experiments, you're really
5	talking about a small number of of people.
6	MR. PRESLEY: Hey, Billy, this is Bob Presley.
7	MR. SMITH: Yes, Bob.
8	MR. PRESLEY: You could look at the four
9	Area 400
10	MR. SMITH: Yes.
11	MR. PRESLEY: and then look at the
12	incidences that we had up at the tunnels
13	MR. SMITH: Right.
14	MR. PRESLEY: and those should be all
15	documented, and then look at the incidents
16	where we had any venting, and that would just
17	about take care of it. Do you agree?
18	MR. SMITH: I agree. I agree.
19	MS. MUNN: Will this be an undue personnel
20	burden?
21	MR. SMITH: Personally, I don't think so.
22	MR. ROLLINS: Well, Martha DeMarre this is
23	Gene Rollins. Martha DeMarre will probably
24	tell you that it is
25	MR. SMITH: Yes.

MR. ROLLINS: -- because she's a -- she's a very busy person and is having a hard time just meeting the day to day requests under this and other programs. But she's been very good in the past and she has come through and provided us with a great deal of information. And so that's -- that's one place we're going to probably get a little bit of resistance, but I -- I still feel like Martha will come through because she's a -- she's been very helpful in the past.

MR. PRESLEY: Hey, Billy or Gene, either one, this is Bob. Would that not be pretty well available from the industrial hygiene reports at the test site, especially in the -- oh, from say like '57 on -- if we could get our hands on the industrial hygiene reports.

MR. SMITH: I'm not sure -- this is Billy. I'm not sure what -- what Pan Am's responsibility was, but I'm sure that there was a project report put together for each test of the nuclear rocket engines, and -- and those -- those would have been sent through DOE -- Smithall was the Space Nuclear -- PO -- Project or something like that. They had to report to

1 NAVU at that time, so I'm sure those things 2 were generated, and that would be part of the 3 historical documents that -- that Martha would 4 have. 5 MR. PRESLEY: Why don't we see then that -- if she has this readily available, and then go 6 back and ask NIOSH if they have the time and 7 8 the money to do this. 9 MR. SMITH: If -- if Mark asked me to do that, 10 I would go over and ask Martha to see what she 11 could come up with. 12 MR. ROLFES: Yes, and I believe we'll have you do that, Billy, so --13 14 MR. SMITH: Okay. 15 MR. PRESLEY: Thank you. Okay, we need -- go 16 ahead, Wanda. 17 MS. MUNN: We understand the -- the difficult 18 part for members of the Board, I think, is 19 trying to identify which of these items is worthy of the amount of time and energy that 20 21 needs to go into it to track it down. Clearly 22 we want to cover the most directly applicable 23 issues rather than minor issues which might 24 affect a very small number of people in a very

small way, but not have a major impact on your

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-- your overall program work and the number of cases that are going to be involved. Just a simple issue of everyone's time, energy and -- and -- it's hard for some of us to lose track of the fact that it's all taxpayer money, so it's -- it's helpful when we can identify what's really of large enough magnitude to impact a variety of -- of issues rather than just a single minor issue that won't affect a POC for more than one or two people. So thanks, if you can get it done.

MR. SMITH: This is Billy one more time. The person who was -- who was directly responsible for the health and safety program at Pan Am when some of these experiments took place was Bruce Church, and Bruce is a person who -- I don't know whether or not he's been interviewed or what information you can provide, but it would seem to me that having a discussion with Bruce would be invaluable in providing some -- some perspective on this issue at NRDS.

MS. MUNN: Can we do that, Mark?

MR. ROLFES: Yes, definitely. I think we should set something up, Billy. I think it'd be a good idea to speak with him if he's

1 available. 2 MS. MUNN: We've done such a good job of 3 covering --4 MR. PRESLEY: Yeah. 5 MS. MUNN: -- people otherwise. 6 MR. PRESLEY: What's that guy's name again, 7 Billy? 8 Bruce W. Church. As a matter of 9 fact, he was a health physicist for Pan Am at 10 the time when this took place and he ended up 11 being in charge of the entire radiation 12 protection program at NTS in his later years. 13 He was at -- he was a Fed when he retired. 14 MS. MUNN: So is he still in the area, easily available? 15 16 MR. SMITH: I think Bruce is up in Utah 17 somewhere. I'm -- I'm sure he'd be easy to 18 find. 19 MS. MUNN: Good. 20 DR. ROESSLER: I know him. I think I can look 21 him up on the Health Physics membership --22 MS. MUNN: That was going to be my next --23 DR. ROESSLER: -- directory and see where he 24 In fact, I can do it sort of right now. 25 MS. MUNN: Wonderful.

1	DR. MAKHIJANI: So so so Mr. Smith, you
2	are going to interview him, is that is that
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4	MR. SMITH: No. No, no, no. I have a
5	conflict because of my involvement in the
6	health and safety program (unintelligible)
7	DR. MAKHIJANI: Oh, so somebody from ORAU will
8	interview him.
9	MR. SMITH: Somebody else will be interviewing
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11	DR. MAKHIJANI: Maybe Gene.
12	MR. SMITH: Bruce.
13	DR. MAKHIJANI: We'd just like to see the
14	interview record when it's done.
15	MR. PRESLEY: Arjun, I'm sure they'd be more
16	than happy to pass that on.
17	DR. ROESSLER: Bruce
18	DR. MAKHIJANI: Yeah. No, I say that because
19	there there still from the last time I
20	mean this is the last item, but I'm might as
21	well say it since it's come up. There are
22	still interview records that that we don't
23	have, the the Brady five hours of
24	interviews, and then there are two other
25	interviews, Arnt Arnt* and Smith, that are

1	now references in the site profile, that are
2	not available so it's it's sort of
3	impossible to track this stuff, or respond to
4	what's going on if we if we don't have the
5	record.
6	DR. ROESSLER: I got I was a little slow
7	there, but Bruce Church is listed in the Health
8	Physics membership list. He's in Utah, and
9	I've got phone numbers and an e-mail address,
10	so I think he's probably quite accessible. I
11	can give whoever wants them, I can give you
12	that later.
13	MR. ROLFES: I'll coordinate with Gene to get
14	something set up then.
15	MS. MUNN: And and what is the issue with
16	the other interviews that SC&A doesn't have
17	yet? Was that classification issues?
18	MR. ROLFES: These were passed through an
19	authorized (unintelligible)
20	MS. MUNN: All right.
21	MR. ROLFES: classifier.
22	MS. MUNN: Fine.
23	MR. ROLFES: Gene, has Laurie mentioned, or
24	Cheryl, do we know anything about the status of
25	those records or have we heard anything back?

1 MS. SMITH: This is Cheryl. I don't quite --2 records -- the interview records or when the --3 MR. ROLFES: Yes, Gene's -- as I recall, I 4 believe Laurie Raunt* was going to have those -5 - those interview records passed through an authorized derivative classifier in Las Vegas -6 7 8 MS. SMITH: Okay. 9 MR. ROLFES: -- and I didn't know --10 MS. SMITH: Yes, I -- I don't know what the 11 status on that is. 12 MR. ROLFES: Okay. 13 MS. SMITH: I know that she put them together, 14 all our e-mails and -- in a long file and it 15 was sent to us, and that was some time ago, so if you would like I could check on it. 16 17 MR. ROLLINS: This is Gene Rollins. I don't 18 know what the status of that is, either. 19 -- in fact I'm -- Cheryl, I don't even know if 20 the classifier is the same person that we used 21 before, but she was very helpful. We'll --22 we'll check on that and get back to you. 23 DR. MAKHIJANI: Yeah, Gene, there -- there are 24 a number of interviews listed here on the last 25 response, 25, and then I was just in

preparation looking at your -- looking at your revised external site profile which you issued a couple of months back and there are two interviews, Arnt and Smith, 2003 and 2004, that I couldn't find. And it's kind of a general request. I mean if -- if -- if things are -- are available to make public and if they're cited like this as personal communications, if a record could be put on the site query database or the O drive or something that -- this wouldn't come up again and again.

MR. ROLLINS: This is Gene Rollins. Cheryl, that sounds like a -- an action for you, Cheryl, since you and Laurie are the ones that are being cited. And typically when we do these TBDs, all the citations are sent with the revisions, so it could be they're already on the O drive.

DR. MAKHIJANI: Okay.

MR. ROLLINS: Bob, this is Gene Rollins. I'm going to have to leave this discussion for about 45 minutes or so, but I will sign back on and let you know when I'm back -- back onto the discussion, but it looks like the next few items might be a good time for some discussion

1 with Billy Smith. 2 MR. PRESLEY: Gene, thank you very much. 3 will catch you when you get back. 4 MR. ROLLINS: I'll be back in about 45 minutes. 5 Thanks. MR. PRESLEY: Okay. All right, we're down to 6 7 response 2(b). 8 2(b) did you say? DR. MAKHIJANI: 9 I think we've about beat MR. PRESLEY: Uh-huh. 10 2(a) to death. We've still got some stuff that 11 needs to be done on that, as everybody's heard. 12 The action on that, add guidance to Chapters 5 13 and 6. I think that's kind of -- we'll do 14 that, but we also have some other things to --15 to add to that now, so... 16 DR. MAKHIJANI: Mr. Presley, I think 2(a) 17 through 2(f) were generally covered because --18 DR. NETON: Yeah. 19 DR. MAKHIJANI: -- some of them are complexwide and some of them are specific to various 20 21 areas. But as I see it, I think we've sort of 22 covered the waterfront on these. Do you agree, 23 Jim? 24 DR. NETON: Yeah, I agree. I was just about to 25 say the same thing.

1 MR. PRESLEY: I just want to make sure 2 everybody's got a chance to say something. 3 DR. NETON: These are all related to (unintelligible). 5 MR. PRESLEY: Right. And my concern is that when we have 6 MS. MUNN: 7 these complex-wide issues that we don't close 8 out what we're doing here until we've pretty 9 much put that to bed, because otherwise we have 10 this same process every time we -- the issue 11 gets raised at every other site. MR. CLAWSON: Well, and -- and we were looking 12 13 at some way of being able to track this, of --14 of where we're at, because we've signed off 15 quite a few of these because they're a complex-16 wide issue. 17 MS. MUNN: Yeah, this -- this is still another 18 topic that has to --19 DR. NETON: I think we need to differentiate, 20 though. It's certainly complex-wide, but as we 21 talked about, there are specific issues here 22 that need to be identified for NTS. 23 MS. MUNN: Right. 24 DR. NETON: When I was speaking of complex-wide 25 issue, I was speaking more of generic guidance

1 to dose reconstructors on how to handle data if 2 they had it -- you know, these type of data. 3 don't know that we have something that says, 4 you know, if you have identified hot particles, 5 then you shall use a one square centimeter area of skin. I would suspect they would do that, 6 7 but you know, without anything in writing and documented to that effect, I -- you couldn't 8 9 quarantee that it would happen consistently. Or the fact that the GI tract model, at least 10 11 in my opinion at this moment, is acceptable for 12 dosimetry of hot particles as they move through that -- that part of the system. 13 Those are 14 just sort of overarching sort of white paper 15 policy issues that we need to put in place --16 MS. MUNN: Yeah. 17 DR. NETON: -- which are separate from the 18 site-specific things. 19 DR. ROESSLER: Is that something that should 20 come up at the next Board meeting, those issues 21 22 DR. NETON: Yeah. 23 DR. ROESSLER: -- plus you mentioned the risk 24 model for the --

The risk model for the skin

DR. NETON:

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1 dosimetry --2 DR. ROESSLER: Seems like that should --3 DR. NETON: -- issue's a little problematic in my mind. I mean I think we have to be 5 conservative in applying the current risk model. 6 7 DR. ROESSLER: Uh-huh. DR. NETON: We need to -- we need to take a 8 9 position on that. 10 DR. ROESSLER: Uh-huh. 11 DR. NETON: And you're right, Gen, there are a 12 number of issues that at the last Board meeting were brought up -- I think by Bob -- that are 13 14 overarching issues, and that on -- that's 15 covered on that list that we intend to provide 16 the Board an update as to status of those 17 overarching issues, at least -- at least 18 identify them and where we are. Some of them 19 are just beginning to be identified, some are 20 going through closure, like the oro-nasal 21 breathing issue. 22 DR. ROESSLER: On the risk model I think you 23 should -- it should be put on the record that 24 what you are using, if you feel that it is a

conservative model, and provide the evidence

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1 for that. I agree, I think it is a 2 conservative --3 DR. NETON: Right. 4 DR. ROESSLER: -- claimant-friendly model. 5 DR. NETON: We do, too, but we'd have to have 6 some scientific, you know, citations we could 7 put in there and document it. 8 250 DAYS 9 MR. PRESLEY: Comment three, we've gotten into 10 this on two. SC&A has agreed with what NIOSH's 11 interpretation of this are, except when you get down to 2(b) -- or 3(b) where we get into this 12 13 250-day issue. Jim, will we discuss that 14 further on down through here? 15 DR. NETON: Now where does 3(b) get into the 16 250 days (unintelligible) --17 MR. PRESLEY: 3(b), telecon (unintelligible) --18 MS. MUNN: Page 6. 19 DR. NETON: It says --20 MR. ROLFES: John Mauro has identified --21 DR. NETON: Yeah. 22 MR. ROLFES: -- (unintelligible) of those. 23 DR. NETON: Time period will affect 250-day 24 issue. What time period are we referring to 25 there? Refresh my memory. (Reading) TBD will

1	(unintelligible) conflict with large hot
2	particle (unintelligible). I'm not quite
3	seeing the connection between the response and
4	the time period here. (Unintelligible) SEC,
5	yeah.
6	DR. MAKHIJANI: Yeah, Jim Jim, I I think
7	that John was was concerned about how the
8	high doses from episodic exposures, or
9	potentially high doses, would affect the 250-
10	day issue. But I think I think that should
11	be it should be covered in that separate
12	report that's going to be discussed on Friday.
13	DR. NETON: Yeah, I think that would be that
14	would not be relevant to this discussion. This
15	is a site profile issue and the other one's an
16	SEC issue.
17	MR. PRESLEY: Right, the other one's SEC.
18	DR. MAKHIJANI: Well, the only way it's
19	relevant is if you can calculate the dose.
20	Right? I mean
21	DR. NETON: Right.
22	DR. MAKHIJANI: if you can do that, then
23	then it's then it's relevant here.
24	Otherwise it doesn't belong here.
25	DR. NETON: Interestingly, this has always been

1 an interesting issue, is that if -- if a hot 2 particle on the skin became a dose that was 3 non-recon-- could not be reconstructed, that 4 would mean skin cancer couldn't be 5 reconstructed -- which are non-presumptive 6 cancers for SEC purposes -- and that would bring in the 22 cancers that are not related to 7 skin, so that's another twist that we need to 8 9 (unintelligible) worry about, but... 10 MS. MUNN: We need to get clearer on that one. 11 DR. NETON: Yeah, I think we'd have to have our 12 OGC folks help us out there, but... Well, I was -- I was a little 13 MS. MUNN: 14 puzzled by the statement that "may solve both 15 problems during literature review, " and I -- I 16 thought our -- who's doing the literature 17 review? 18 DR. NETON: Well, we're --19 MR. ROLFES: This was John Mauro's comment, so 20 I would believe that it was SC&A. 21 MS. MUNN: Okay. 22 DR. MAKHIJANI: Sorry, are we -- we will -- we 23 will touch on this in our 250-day report 24 briefly, in -- in the December report -- in the 25 report that you'll see this Friday, but -- but

1 probably more at length prior to the Board meeting because -- well, frankly, had hoped to 2 3 see something from NIOSH on the hot particle 4 question by now but we haven't seen anything 5 yet, so we'll have to discuss internally how we 6 -- how we handle it since this has been in --7 in NIOSH's court. I guess we'll have to take 8 it up in some way as it concerns the 250-day 9 question. 10 MS. MUNN: Yeah, this is -- for -- for us here, 11 Arjun, in this group, it poses kind of a 12 problem because it sort of overlaps into the --13 the Friday group, which is not the same batch 14 of individuals. 15 DR. MAKHIJANI: Right. 16 MS. MUNN: We -- we have to -- we have to sort 17 of balance that back and forth. 18 DR. MAKHIJANI: Right. 19 MS. MUNN: Thank you. 20 Arjun, this is Hans, I just have DR. BEHLING: 21 a ques--22 MS. SMITH: Excuse me, this is Cheryl Smith. 23 Steve Merwin* found out on the internet 24 yesterday a DOL bulletin, 06-16, and in that 25 bulletin it indicates that we are to -- if

1	there's evidence that an employee was present
2	on site at the NTS for 24 hours in a day for 83
3	days, the employee will have the equivalent of
4	250 workdays and will meet the 250-workday
5	requirement.
6	MS. MUNN: Yeah, so DOL has accepted that as
7	policy.
8	MS. SMITH: Correct.
9	MS. MUNN: Yeah, right.
10	MS. SMITH: Okay.
11	MR. PRESLEY: That horse is
12	DR. NETON: Yeah, we knew that was coming.
13	MR. PRESLEY: put back in the barn.
14	DR. NETON: I guess I'm still not seeing the
15	connection here. I mean if we can do hot
16	particles, we can do it in the site profile.
17	We talked about identifying areas where hot
18	particles may have existed. We talked about if
19	there were hot particles we would calculate a
20	dose to one square centimeter of skin using
21	Varskin. I mean those methods are all there.
22	I'm not sure
23	MS. MUNN: Well, we may have captured something
24	in this comment that wasn't
25	DR. NETON: But Arjun has been suggesting, and

1 I agree with him, that may be -- that's an 2 issue for Friday that -- that talks about how 3 large these doses may have been from an 4 instantaneous or short-term exposure, less than 5 250 days. That's -- that's -- that appears 6 relevant, but I don't know if that needs to be 7 brought into this discussion. 8 MS. MUNN: Yeah. 9 DR. BEHLING: The question I have is why is it 10 unique to hot particles? You can have a single 11 inhalation exposure that does not involve hot 12 particles and have a very large dose associated 13 with that incident that is no different from a 14 single large dose of a hot particle, so --DR. NETON: Well, but --15 16 DR. BEHLING: -- (unintelligible) the issue's 17 not unique to hot particles. 18 DR. NETON: But if -- if that is the only 19 scenario that could get you to that high 20 dose... 21 DR. BEHLING: Well, you can inhale an 22 incredible amount of plutonium in a single 23 event --24 DR. NETON: But did that happen here at NTS. 25 That's the question.

1 DR. BEHLING: No, no, but I'm --That's what I'm saying. 2 DR. NETON: 3 DR. BEHLING: There's nothing unique about this 4 5 Well, I --DR. NETON: 6 DR. BEHLING: -- (unintelligible) hot 7 particles. 8 DR. NETON: -- understand that, but what we're 9 saying here is, relevant to NTS and high 10 exposure scenarios that would potentially get a 11 class in with less than 250-day exposures, it 12 appears that SC&A is suggesting that the hot 13 particle issue is one of those high -- high 14 potential scenar -- exposure scenarios. I'd be 15 interested to hear what -- what's talked about 16 on Friday. 17 MS. MUNN: Yeah. 18 DR. NETON: Is that right, Arjun? I mean 19 that's sort of the connection I 20 (unintelligible) --21 DR. MAKHIJANI: Well, you know, I -- we haven't 22 -- I had -- I'm -- I'm drafting this with --23 with a couple of other people, and where I am 24 right now is I haven't said anything about it 25 because, as I said, I was hoping to see

something -- something from NIOSH/ORAU team about this but -- but we haven't. And so now I have to go back to the drawing board a little bit and -- and talk with John about -- I don't think we'll say very much on Friday, but I hope that we'll discuss it some and be able to present something to the Board, one way or another, so -- so at least they can decide that it is relevant or not relevant. And -- and I don't have an opinion about this at this stage 'cause...

MR. PRESLEY: Okay. Then we will go on down through response 3(c) and get into response comment four. And Gene has --

DR. NETON: Okay, this is an area where -- this is -- this is truly an overarching issue. This is -- let me read the comment here (pause).

This is -- this is truly an overarching issue that we've been working on for some time now, and our latest projection is that we'll have a completed report not -- by January. We have an outside contractor working with us on this.

They've done an exhaustive review of the literature on this. There's many more papers out there than I was able to find that they've

1 located, and they're putting their heads 2 together and coming up with -- well, there's 3 some writing that the -- the literature for us, 4 and then NIOSH will make an informed opinion at 5 that point about how we're going to do this. 6 MS. MUNN: Good. 7 MR. PRESLEY: That'll be great. 8 So this is coming up in --DR. ROESSLER: 9

MS. MUNN: January.

DR. NETON:

DR. ROESSLER: -- January?

DR. ROESSLER: And who is the outside contractor?

EG&G

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EG&G is working on this for us, DR. NETON: (unintelligible) and others, and they're -they're real go-getters. They've pulled out a lot of literature, a couple of feet of literature on this topic. But there's some interesting work out there. This of course is relevant in the context of the Bethlehem Steel site profile review and in respiration at steel mills, so we've actually located these documents of physiological work that's been done on these steel mill workers and such. But

That's -- that's what --

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that doesn't address the fundamental issue of oro-nasal breathing, which is -- there's a certain percentage of the population that breathes through their mouth, so I think it's -- it's fairly high, it's somewhere around 25 percent. So then the question is would NIOSH default in every single dose reconstruction to inhalation through the mouth as the mode of entry, and in many cases that will increase the dose -- lung dose for the intake. And should that be our default position or should we go and try to poll all of these -- all of the claimants to find out if they were mouthbreathers. I think that would be just an impossible task. Or should we incorporate this into the uncertainty, or is it already addressed in the overall uncertainty of the dosimetry model itself. There are some papers out there that suggest -- and I think I've mentioned this before at Board meetings -- that the -- the variability -- the uncertainty -distribution of breathing rates among regular breathers is equal to the distribution of the variability among mouth-breathers versus regular breathers such that the uncertainty --

by making one correction you don't fix the problem because the un-- the overall uncertainty is large. And so we have to decide whether we're going to either make it a default position; try to poll workers and find out what they really were breathing, oral or nasal breathing; or try to incorporate the oro-nasal breathing into the overall uncertainty of the dosimetry models and such. Those are -- in my mind those are our three options and -- that we'll weigh in on in January. Not an -- not an easy issue. It's taken a while.

MS. MUNN: No, it isn't. But I will certainly be pleased to see it put to bed.

DR. NETON: One also has to consider this in the context of this is just one variable of many in the dose models. You have variability in the size of the individual lungs themselves, so should one now all of a sudden account for the fact that a woman who's petite has an 800 gram lung, versus a male who may have a 1,500 gram lung, and it brings into play all these issues. And we're going to try to have some sort of a nice scientific discussion of these issues and what this really means overall in

1	the dose reconstruction process.
2	DR. ROESSLER: So is the contractor then
3	working on all of these issues or just the
4	percentage of people who are
5	DR. NETON: No, no, they they pulled out all
6	the papers on many of the issues that
7	(unintelligible) identified, but it of course
8	remains NIOSH's responsibility to consolidate
9	these into an opinion. They they certainly
10	summarized blocks of information for us, but
11	(unintelligible).
12	MS. MUNN: That's good. I can see that would
13	be a an extremely difficult literature
14	search.
15	MR. PRESLEY: Somebody's
16	DR. WADE: We have a bad buzz.
17	MS. MUNN: Ah, someone did something nice.
18	MS. HOMOKI-TITUS: Thank you.
19	DR. WADE: The world is still out there with
20	us. Liz, are you with us?
21	MS. HOMOKI-TITUS: Yes, I am. Thank you.
22	DR. WADE: Okay, just to make sure the world is
23	with us. Thank you.
24	DR. NETON: Comment four I think needs to be
25	needs to remain as a complex-wide issue and we

1	will provide an update as to where we are at
2	the December Board meeting.
3	MR. PRESLEY: December?
4	MS. MUNN: Updating.
5	MR. PRESLEY: Is that just an update, and then
6	February
7	DR. NETON: We don't plan to be done until
8	January. It will be on the list of issues to
9	have a status update.
10	MS. MUNN: Excellent.
11	MR. ROLFES: Bob, if it's all right with you,
12	I'd propose that we skip past comment five
13	until Gene Rollins returns.
14	MR. PRESLEY: I think that's great. No
15	problems whatsoever with that. Anybody else
16	have a problem?
17	(No responses)
18	We'll go back to comment five when Gene comes
19	in comes back.
20	Okay, six has to do with the average air
21	concentration values.
22	MR. ROLFES: I think this will also tie in to
23	the resuspension issues, as well.
24	MR. PRESLEY: Yeah.
25	MR. ROLFES: I think that Gene would probably

There was a OCAS

1 be best to discuss this issue, so --2 MR. PRESLEY: I think five and six are 3 (unintelligible) --4 DR. MAKHIJANI: Yeah, Mr. Presley, Mr. -- the 5 issue seven also is --6 MR. PRESLEY: Yep, seven's the same way. 7 DR. MAKHIJANI: -- is the same way. 8 EXTERNAL DOSE DATA FOR 1963 AND '66 9 MR. PRESLEY: Okay, get down to eight. Okay, 10 claimant issue -- or comment eight is where the 11 external dose data for 1963 and '66 is not 12 claimant-favorable. The response was accepted 13 on the external dose, and work was completed 14 pending a sign-off of Chapter 6, Revision 15 00PC2. Has that been done yet? 16 MR. ROLFES: The work was updated. I believe 17 we received some tables of external dose data 18 from Martha DeMarre and have incorporated into 19 a draft of our Nevada Test Site profile, 20 although I do not believe it has been 21 officially approved by NIOSH yet. Is that --22 is anyone out there that can comment on that --23 Cheryl? 24 MS. SMITH: This is Cheryl. Yes, it is still -

- there's some modifications.

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1	comment that came back asking for 95th
2	percentile, so the information is being
3	presented in a different form, with slightly
4	different guidance. And hopefully that will be
5	the math the mathematics of it was done
6	fairly recently. It's in the process of being
7	checked, and hopefully we'll have the response
8	to OCAS by the end of the week.
9	MR. PRESLEY: Okay.
10	MR. ROLFES: Thank you, Cheryl.
11	MR. PRESLEY: Are y'all also going to get SC&A
12	a copy?
13	MS. SMITH: Sure, we can do that.
14	MR. PRESLEY: Arjun?
15	DR. MAKHIJANI: Yes, Mr. Presley, I I
16	presume that it will be posted in some way or
17	circulated in some way when it's done.
18	MS. SMITH: Well, ye it'll be part of the
19	TBD, it'll be a page change to the Rev. 0 TBD.
20	MR. PRESLEY: Okay.
21	DR. MAKHIJANI: Now you posted the Rev. 0PC-1
22	in June.
23	MS. SMITH: Correct.
24	DR. MAKHIJANI: So so you'll post a page
25	change to that?

1 MS. SMITH: Correct, there will be a page 2 change, and that'll -- I -- that's -- that's 3 part of the document control process. 4 DR. MAKHIJANI: Yeah. 5 MS. SMITH: I mean it's still -- in a sense, until OCAS signs off on it, it's, you know, not 6 7 official. 8 DR. MAKHIJANI: Yeah, but Mr. Presley, I -- I 9 think that -- that the actions that -- that 10 NIOSH is taking on this are -- are fine. 11 MR. PRESLEY: Okay, that's good. Okay, go to 12 nine, and this is lack of environmental external dose data for '68 through '76, and 13 14 that has been completed. Does anybody have any comment to -- before we move on? 15 16 (No responses) 17 All right. 18 MS. MUNN: I'm wondering about that comment 19 from the teleconference, the Board has no 20 mechanism to prove this is complete. I don't 21 know what we have to have --22 MR. PRESLEY: Yeah. 23 MS. MUNN: -- exactly. 24 MR. PRESLEY: I don't, either. 25 MS. MUNN: If it's complete, it's complete.

MR. PRESLEY: Somebody says it's complete, we go through and say the Board says it's complete. That, to me, is the -- the action.

MS. MUNN: Yeah, it is to me. I'm not sure why we have that -- why I asked that question, that -- or why it's on there that way. I guess -- I think -- my memory is that this dates back to the issue we've already touched on, the fact that we don't have any mechanism set up for tracking actions that -- that we've initiated, that we have on a matrix, that we show on the matrix as complete, but then we don't have any tracking mech-- I think that's what that was about, so --

DR. MAKHIJANI: Ms. Munn, may -- may I ask a question or make a suggestion? I don't know whether Jim Neton or ORAU may agree with this, that it would make this easier, is -- is when we go through this process and, for instance, like that page change is done, if on the page change it indicates that it's a response to such-and-such item, or such-and-such discussion. Then we could all see that it's complete and there wouldn't be a question.

Right now I don't think that when the TBD is

changed, say in response to matrix issues that

I -- that I see that it refers to those issues.

It -- it might make tracking sort of very simple.

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MS. MUNN: Yeah, it would for us. It would probably complicate things for others. thing that concerns me about that suggestion, Arjun, would be that these are public documents. And if we're going to reference something like our matrix, then we're going to have to do something like put the matrix -matrices out there somewhere. And even though they are public documents and can be obtained, it -- it really kind of muddies the water to have our -- our working documents that -- that are -- they're easily misconstrued, I think. There are statements on the working documents are -- are easily misconstrued. But I -- I guess -- I -- I'd prefer to have us think on that for a little while and think about how it would be best for us to -- I guess I would prefer to see a different table entirely as a -- as a working document for the working groups. That document could identify the matrix item by name and by working group, and identify that it

1	was closed. That, I think, would be
2	certainly for me, as a member of several
3	working groups, that would be easier for me to
4	follow than trying to do so on the when the
5	page correction occurs or when the document
6	correction occurs.
7	DR. WADE: Right, and this is Lew Wade. We
8	we've approached this issue several times, but
9	we really haven't finalized it. I think when
10	the Board meets in December we really need to -
11	-
12	MS. MUNN: Address that.
13	DR. WADE: put a procedure in place that
14	we'll follow on that.
15	MS. MUNN: Yeah, get it to the ground.
16	DR. WADE: So I'll see that we have that as
17	part of our discussion in December.
18	MS. MUNN: Thank you.
19	MR. PRESLEY: Do we really need this comment
20	then from 9/6/06 on here?
21	MS. MUNN: Well, we have both of them there.
22	It may
23	MR. PRESLEY: Well, it's confusing. It says
24	that, you know, the action the work is
25	completed, and then we say that we have no way

1	or mechanism to provide us that this is
2	complete.
3	MS. MUNN: Yeah, maybe we should drop both
4	those off there since, as everybody agrees, it
5	is a it is a project-wide issue that we have
6	to address and the whole Board will have to
7	address it. We all know it.
8	MR. PRESLEY: Okay, comment ten, TBD does not
9	provide any guidance for pre-1963 external
10	environmental dose. It's been marked as work
11	complete pending sign-off of Chapter 6 revision
12	00PC2.
13	MS. MUNN: Yeah, that's the one they just
14	talked about
15	MR. PRESLEY: Right.
16	MS. MUNN: and so we're it's done.
17	MR. PRESLEY: And so that right there, to me,
18	has been taken care of.
19	MS. MUNN: Yeah.
20	MR. PRESLEY: That correct?
21	MS. MUNN: Correct.
22	DR. ROESSLER: And the comment should come off
23	then about data integrity and reliability.
24	MS. MUNN: Yeah.
25	MR. PRESLEY: Can we take that off? Can we

1 delete that, Wanda? 2 MS. MUNN: Yes, I would suggest that we do, on 3 both that one and comment nine, because that... 4 CORRECTION FACTORS FOR EXTERNAL ENVIRONMENTAL DOSE 5 MR. PRESLEY: Thank you. Comment 11, correction factors for external environmental 6 7 dose. There's been a resolution developed with 8 -- in response to 2(b). The action on this is 9 development of correction factors is in 10 progress. Results will be incorporated in 11 Chapter 6, Revision so-and-so. Now this is an 12 ongoing issue, is it not? 13 MR. ROLFES: Yes, that's correct. I believe 14 Richard Griffith from ORAU -- he's not 15 available today -- but he has been working on 16 correction factors for -- for various 17 geometries. Cheryl, could you please give us 18 an update on Richard Griffith's correction 19 factor work? 20 MS. SMITH: I'd -- I basically cannot. I know 21 he has been working on it. I'm kind of 22 wondering how does this affect our -- our 23 blanket use of AP geometry. 24 DR. NETON: Well, I think -- I think AP

geometry is a default unless one can identify

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1 other unique exposure scenarios at a specific 2 site. 3 MS. SMITH: Okay. Okay, so we would be allowed 4 to -- to --5 DR. NETON: Oh, sure, yes. 6 MS. SMITH: -- (unintelligible) use this in our 7 dose reconstruction. 8 Yeah, this is not unlike what DR. NETON: 9 happened at Mallinckrodt where we -- you know, 10 we proposed to use AP geometry and then SC&A 11 identified, you know, a situation where if you 12 have a spill contamination on the -- on the ground -- a planar source on the ground --13 14 MS. SMITH: Sure. 15 DR. NETON: -- you know, the response of a 16 badge on your chest pocket is not going to be 17 the same as if it was an AP exposure. This was 18 identified at the last Board meeting as a -- as 19 a complex-- an overarching issue. I'm not convinced that it really is. It is -- it 20 21 certainly affects all sites, but it -- it's such a site-specific situation. I mean every 22 23 site has the potential for some unique exposure 24 scenario, whether it's overhead piping or 25 spills or some machine that they were using

1 that was unique. I think the -- the answer 2 there is we just need to identify -- and be 3 very careful for each site that we identify those scenarios and account for them in our 4 dose reconstructions, with the default being AP 5 geometry unless we can show otherwise. 6 7 DR. MAKHIJANI: Jim --8 DR. NETON: Yeah. 9 DR. MAKHIJANI: -- it may -- you know, since 10 you already did the calculations for -- for 11 Mallinckrodt, I think one of the things that 12 does come up is -- is that same scenario with 13 the planar source below the worker. And it may 14 be useful, since you've already done the 15 calculation -- I don't know, maybe the dose 16 reconstructionists will correct me -- may be 17 useful to have, you know, a 2-page TIB that 18 says when you have a --19 DR. NETON: Right. 20 DR. MAKHIJANI: -- job situation like this, use 21 this correction factor. 22 DR. NETON: That's a good point 'cause I think 23 the TIB right now is specific for Mallinckrodt. 24 DR. MAKHIJANI: Yeah, right. 25 DR. NETON: And I'm not -- I'm not sure we

wouldn't use this in comment 11. I don't really know what they're doing right now, but it's a good point. We could have a generic TIB that would say for these somewhat common exposure scenarios like a planar source on the ground or overhead piping or, you know -- the two or three that we've done already, we could put it in there and say use this. It's a good point.

MR. PRESLEY: So we can say that NIOSH will develop a separate TIB for this item?

DR. NETON: Well, I wouldn't hold up resolution of this comment --

MR. PRESLEY: No.

DR. NETON: -- for that. I think that -- that falls maybe into the overarching issues where we would make it easier on dose reconstructors if we develop a generic TIB for -- (unintelligible) call -- alternate geometries. I'm not sure I'd want to tie that to this comment resolution 'cause this -- this is just -- really ground contamination I think is what's discussed here, and I don't know why we couldn't just adopt -- adapt the Mallinckrodt approach. We did a full Attila run on that.

1 MS. MUNN: We had pretty general consensus 2 about receiving that direction with 3 Mallinckrodt, as I recall. 4 DR. NETON: Oh, yeah, I think... 5 MS. MUNN: So... But I think that we could just move 6 DR. NETON: forward and correct this for this particular 7 8 situation, but then leave the badging geometry 9 issue on the overarching issue list. 10 MS. MUNN: Uh-huh. 11 DR. NETON: And I think the resolution of that 12 comment would be to have a generic TIB to talk 13 about a couple of these alternate geometries. 14 MS. MUNN: Obviously existing things. 15 DR. NETON: Yeah, things that make sense. 16 MR. PRESLEY: Okay. 17 DR. MAKHIJANI: I agree with that. I think 18 that will just solve this problem faster since 19 there's a very specific issue here to be solved 20 and we already have the solution. 21 MR. PRESLEY: Okay, can we say that -- that on 22 this particular comment then that no further 23 action will be needed other than your revision 24 to Chapter 6? 25 DR. WADE: Yes.

1 MR. PRESLEY: That an overarching --2 DR. NETON: I would just say revise Chapter 6, 3 and then maybe just make a parenthetical note 4 that NIOSH will address this as a complex-wide issue with a -- with a -- development of a TIB. 5 So that wouldn't -- that TIB would not need to 6 7 be issued to close this particular comment. 8 MR. PRESLEY: Right. 9 DR. NETON: But I agree with Arjun, it will --10 it will save time down the line if we do 11 address this with a TIB that gives the dose 12 reconstructor some flexibility just to pull off 13 the shelf the correction factors. 14 MS. MUNN: Okay, that's -- but for this item 15 there's no further action by the -- by this 16 workgroup. Right? 17 DR. NETON: Well, other than to verify the 18 closure that we actually did the revision --19 MS. MUNN: Chapter 6 is in revision. 20 It's not done, it's in revision. DR. NETON: 21 MS. MUNN: But it's in revision. 22 In revision. MR. PRESLEY: 23 MR. CLAWSON: We're back to the thing of 24 tracking. 25 DR. WADE: We go there often.

you've at least heard from us that we've got Chapter 6 revised. MS. MUNN: We'll just indicate that it's stil in progress. MR. PRESLEY: Okay, what I did is I've got NIOSH will address this with a TIB/no action except to accept Chapter 6. Is that correct? MS. MUNN: Sort of. MR. PRESLEY: Sort of? DR. MAKHIJANI: Mr. Presley, I think I thi the specific thing that that Jim was suggesting there is to incorporate the Mallinckrodt calculation into Chapter 6. Tha would be NIOSH's action, and then the separate
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would be NIOSH's action, and then the separat
action on the TIB.
DR. NETON: Yeah.
DR. MAKHIJANI: Which is not connected to the
NTS resolution.
20 MS. MUNN: Yeah.
MR. PRESLEY: Okay, so you do you agree to
do that?
DR. NETON: I might want to agree exactly to
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I'm sure the Mallinckrodt works, but I I'd

1	it and make sure it's the same fit. I can't
2	imagine it wouldn't be, although we may have
3	limited the size of the contamination around
4	the worker we we might need to look at it
5	to see if Mallinckrodt is a perfect fit.
6	DR. MAKHIJANI: Yeah, I agree, Jim, now that
7	you mention it, I think it was a restricted
8	geometry which you're going to have to look at.
9	I think you you'll have to redo the
10	calculation.
11	DR. NETON: Yeah. We may we may have to
12	look at it
13	MR. PRESLEY: Or come up with a separate
14	calculation?
15	DR. NETON: Yeah.
16	DR. BEHLING: What is the assumption energy
17	photon energy assumptions?
18	DR. NETON: For Mallinckrodt? I don't
19	remember.
20	DR. BEHLING: I don't (unintelligible).
21	DR. NETON: Yeah. Good point, too. I think
22	DR. BEHLING: When you look at fission
23	products, I remember looking at the energy
24	spectrum from fresh fission product, and they
25	have three discrete areas. There's the low

energy and there's one that's near the 800 keV
and then there's one that is between one and
two, which which if you really deal with
very high-energy photons, an infinite planar
source would yield a DCF that's basically
unity, and therefore you could default to unity
and get this whole thing out of the way.
DR. NETON: I think we need to do some modeling
here yet and I think the development of
correction factors is in progress is still a
more
MR. PRESLEY: That's going to come out
DR. NETON: (unintelligible) response.
MR. PRESLEY: That's going to really come out
in Chapter 6. Correct? And so until until
you all get that out and we accept it,
everything sets on hold.
DR. NETON: I think so.
MR. PRESLEY: Okay.
DR. NETON: I think we've got some ideas of
starting points, but I don't know really what's
been done
MR. PRESLEY: Okay.
DR. NETON: (unintelligible) overall focus.
MR. PRESLEY: Anybody else have anything else

1 before we go to 11(b)? 2 MS. MUNN: No, but -- you are going to put in 3 that little parenthetical calling out that 4 possible separate TIB in order for generic 5 alterna -- (unintelligible) geometries as a 6 complex-wide issue. 7 MR. PRESLEY: As a complex-wide, I -- I said --8 what I've got in here is NIOSH will address 9 this with a TIB, no action except to accept 6, 10 Chapter 6, and we need to -- when it's revised. 11 MS. MUNN: Well, I guess what I thought was 12 happening was that they would attempt to 13 address the generic issue with a TIB, but this 14 particular one will not be waiting for that. 15 DR. NETON: Right. 16 MR. PRESLEY: Right. 17 MS. MUNN: This particular decision on this 18 site will -- will look at -- at previous 19 decisions that have been made and follow from 20 there. 21 MR. PRESLEY: Okay. 22 DR. NETON: Did you get that in one sentence? 23 That'd be great. 24 MR. PRESLEY: No, I don't have it in one sen--25 MS. MUNN: Twenty-five words or less.

1 MR. PRESLEY: Ray's going -- Wanda's going to 2 put that down on hers, so --3 MS. MUNN: Yeah, okay. 4 MR. PRESLEY: -- it can be that compact. 5 DR. MAKHIJANI: Mr. Presley, I also have notes 6 and I'll share them with you. 7 CORRECTION FACTORS 8 Thank you. Oh, 11(b), on this we MR. PRESLEY: 9 -- again, we get back to response 2(b), and the 10 action on this was develop the correction 11 factors and the progress. All ri-- and again 12 this has to do with Chapter 6. 13 DR. NETON: I'm a little confused as to what 14 this is referring to. NIOSH agrees to develop 15 external dose correction factors for angle of 16 incidence when it is not normal to the badge. 17 MR. PRESLEY: That's where we were discussing 18 where the badge was at the waist or where the 19 badge was at the chest or around the neck 20 and... 21 DR. NETON: Then this refers back to --22 MR. PRESLEY: 2(b). 23 **DR. NETON:** -- response 2(d). 24 MS. MUNN: Uh-huh.

MR. PRESLEY: I mean 2(d), not 2(b).

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1 DR. MAKHIJANI: I -- I do not know why this 2 refers to response 2(d). 3 DR. NETON: Well, it's -- it specifically --4 you know, this is gonads, the prostate. 5 got the original matrix with me that refers to 6 the page of the review -- correction factors 7 for external -- it says here correction factors 8 for external environmental dose due to geometry 9 of organ relative to badge and angle 10 (unintelligible) dose conversion factor needs 11 to be developed. So environmental dose. 12 this still referring to the planar 13 contamination issue again? I mean --14 DR. MAKHIJANI: I -- I don't know. 15 actually -- let me see, am I on mute? 16 DR. NETON: No, you're okay, Arjun. I can hear 17 you. 18 DR. MAKHIJANI: I actually -- I'm a little 19 puzzled by this item and why -- why it's a --20 why it's a separate item, because this is -- it 21 seems like the same as 11(a). 22 DR. NETON: Yeah, as a matter of fact I'm 23 looking at the actual review you guys did. Ιt 24 says the organ for which doses are being 25 estimated relative to the position of the

1 external radiation source -- that is organs 2 closer to the ground -- will tend to get a 3 larger dose than those far away, so the organ-4 specific dose estimation -- this is the same 5 kind of thing, really. 6 DR. MAKHIJANI: Yeah, I -- I think that when 7 you consider 11(a) you can consider 11(b) part 8 of it. I do not remember why this refers back. 9 I quess -- I quess you'll have to ask Gene why 10 it refers back to 2(d) because it's never come 11 I guess I missed that piece of fine print. 12 It says that in 11(a) also, and I also don't 13 understand that in relation to 11(a). 14 MS. MUNN: Well, but 2(d) is talking about the 15 issue of beta/gamma dose to the gonads and 16 possibly prostate being evaluated in light of 17 the dose estimating... 18 DR. NETON: Yeah, here's -- here's -- I've got 19 a little more intelligence on page 71 -- I'm 20 sorry, Wanda. 21 MS. MUNN: No, go ahead. 22 This has to do with this whole AP 23 and -- and the --24 MS. MUNN: Yeah. 25 DR. NETON: -- the geometry, and it's

1 acknowledged in the review that the adoption of 2 the AP geometry for this exposure is claimant 3 favorable for photon energies above 250, 4 positive bias around 20 percent will be seen 5 with respect to the rotational geometry, but 6 then they argue that for best-case dose 7 estimates, NIOSH has to correct for the general 8 dose conversion factors published in the 9 procedures. 10 Boy, that's -- we -- we could I quess arque 11 that that's as far as we're going and we won't 12 be able to do any better than that and that's best case. I mean I don't know. 13 I quess 14 you'll have to leave this one open, now that I understand it better, but I would get the 15 16 reference to 2(d) out of there. 17 Yeah, but it appears to be. MS. MUNN: 18 MR. PRESLEY: It's still -- I believe it's part 19 of (d). 20 DR. MAKHIJANI: I think this occurs on page 71 21 of our review --22 DR. NETON: Right, that's what I just read. 23 DR. MAKHIJANI: -- and I'll -- we might need to 24 go back to the fuller explanation 'cause 25 sometimes these short things get so cryptic

1 that --2 DR. NETON: Right. 3 DR. MAKHIJANI: -- it's hard to figure out what the original point was. 4 5 MR. PRESLEY: Well, it says --6 DR. NETON: Well, the bottom line says we're 7 going to develop correction factors --8 MR. PRESLEY: Right. 9 DR. NETON: -- but I'm not --10 MR. PRESLEY: Right. 11 DR. MAKHIJANI: Yeah. 12 DR. NETON: -- sure what we're doing --13 DR. MAKHIJANI: I think so. That's the main 14 point that's made in that finding in 5.7.6 that's referred to. The 5.-- 5.3.6, the other 15 16 one, is an environmental dose finding, which I 17 think is covered elsewhere and we've said that 18 omitting environmental dose for badged workers 19 is not an issue, shouldn't be taken into 20 account --21 DR. NETON: Right. 22 DR. MAKHIJANI: -- so that -- that's been 23 resolved separately, I think. 24 MR. PRESLEY: And we -- can we leave this that 25 NIOSH will develop correction factors?

1 DR. NETON: I think so, and we'll go back and 2 look at pages 43 and 71 of the original review 3 report and make sure that whatever we do is 4 consistent with the comments that are made 5 there. 6 25/75 SPLIT 7 MR. PRESLEY: Okay, 11(c) has to do with the 8 25/75 split, and NIOSH will provide an 9 explanation of the split on a best-estimate 10 basis. Have y'all had a chance to do any work 11 on that yet? 12 MR. ROLFES: Cheryl, I have this marked as the 13 work has been completed here. 14 Yes, and I -- I can't speak to MS. SMITH: Grif and -- and I know that the 25/7515 16 split is in the TBD and that we do use it, but 17 -- what the explanation has been, but I can 18 follow up and ask Jack if he's -- I don't know 19 that he's in today. He may be actually back in 20 Cincinnati. 21 MR. PRESLEY: Cheryl, this is Bob Presley. Ιt 22 says that it -- that it's in the Chapter 6 23 revision.

And we should get that when the

MS. SMITH: Okay.

MR. PRESLEY:

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1 revision comes out. 2 MR. ROLFES: Correct, when NIOSH approves it. 3 MR. PRESLEY: Right. 4 MS. SMITH: Right. 5 MR. PRESLEY: Okay. 6 MS. MUNN: So it's just awaiting approval. 7 STATISTICAL METHODS 8 MR. PRESLEY: Let's go ahead. Okay. right, (e) -- 11(d), NIOSH will develop 9 10 statistical methods to --11 DR. ROESSLER: Yes, I'd be interested in 12 knowing what that means, that NIOSH will 13 develop statistical methods to determine if 14 practice was widespread. 15 Something to do with the workers DR. NETON: 16 not wearing their badges --17 MS. MUNN: Hiding their badges (unintelligible) 18 19 Hiding their badges. MR. PRESLEY: 20 We had talked about this before in DR. NETON: 21 the context I think of Rocky Flats and then 22 some of the other sites -- Hanford, I think, 23 there's also an issue. Our thought on this was 24 if we have particularly robust data and data 25 that approached -- many times these workers

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were asserting that they were told not to wear their badge after they reached the detect-reached the exposure limit so they could just continue to keep working and report no dose over the limit. And our thought on that was if we have sufficient data -- this didn't pan out for Rocky Flats and I don't know if it would for NTS, but with sufficient data you could look at the distribution of workers' badges and see if they actually continued to rise towards the limit or started to tail over and flatten off as they got to the limit, which would -which would be evidence, not conclusive evidence but some evidence that that occurred. If the slope of that cumulative dose over the monitoring period -- over the year continued to rise, then it would not tend to support the theory that the workers were leaving their badges in the rack because they continued to receive incremental dose. But that -- that would work for internal.

MS. MUNN: Well, the continu-- the converse argument would be that that could also be taken as indication that their supervision recognized their approaching of the limits and changed

1	their work pattern so that they would not
2	continue
3	DR. NETON: True, it's not (unintelligible).
4	MS. MUNN: to be exposed, so it there
5	it's just as indicative in one direction as it
6	is another.
7	DR. NETON: I'm aware of one case as a
8	matter of fact, one of the first cases we ever
9	did at NTS where the worker worker's
10	badge results stopped increasing, they said he
11	was taken out of the workplace, when in fact he
12	was monitored for tritium and his tritium
13	values were as high as ever over in the next
14	six months, so
15	MS. MUNN: Yeah.
16	DR. NETON: that was pretty conclusive
17	evidence in our mind that
18	MS. MUNN: Right.
19	DR. NETON: he was still working.
20	MS. MUNN: Then you have a basis for making
21	your
22	DR. NETON: So you know
23	MS. MUNN: decision.
24	DR. NETON: statistical methods may be a
25	little a little too loose, but

1	DR. ROESSLER: I understand what it means
2	DR. NETON: (unintelligible) concept
3	DR. ROESSLER: now, yeah.
4	DR. NETON: that we're trying to play with.
5	I don't know whether these will come to
6	fruition or not. And then if they don't pan
7	out, you're you're in a situation where,
8	you know, how how to deal with it. And then
9	you get into this sort of weight-of-the-
10	evidence approach.
11	MS. MUNN: Well, when you have a bioassay, you
12	really don't
13	DR. NETON: (Unintelligible) bioassay.
14	MS. MUNN: wring your hands about it very
15	much.
16	DR. NETON: Right. All we could do with this
17	analysis was to determine if the practice was
18	or was not potentially widespread.
19	MS. MUNN: Yeah.
20	DR. NETON: It still wouldn't preclude the
21	situation where a couple of isolated workers
22	may have done that. In those cases where
23	workers do assert that, though, we would you
24	could assume them to be unmonitored at that
25	point and then go to coworker models. That

1 would be an approach. We've done that, I 2 think. 3 MR. PRESLEY: Can we highlight this as a complex-wide issue and that no other action 5 would be required by the working group? 6 MS. MUNN: Yes, that's what we've got. 7 DR. NETON: Well --DR. MAKHIJANI: Now Jim, am I to understand 8 9 that this statistical analysis is being done for NTS? 10 11 I don't know, Arjun, that's -- I'm DR. NETON: 12 kind of getting into this a little later, but I 13 think it says that's what we're doing, so --14 DR. MAKHIJANI: Yeah, because I remember you were saying this some time back --15 16 DR. NETON: Yeah. 17 DR. MAKHIJANI: -- or someone saying that would 18 be the approach, and I think it would be very 19 useful to see that. 20 Right. And you know, even if we DR. NETON: 21 develop this complex-wide -- it's a complex-22 wide issue, but the approach we take to 23 evaluate this issue is site-specific -- again, 24 as is usual. And we do have to address this 25 for NTS. I mean us coming up with a potential

1 approach to solve this issue would not work. 2 We'd have to apply it to NTS. 3 Does anyone on the ORAU side that's on the telephone know if this is being worked on at 5 this moment? 6 This is Cheryl. The coworker doses MS. SMITH: 7 that were developed that are in that page 8 change that was referred to earlier -- probably 9 this -- this was data that Jack Fix got from 10 Martha, and I think other than going through 11 lots and lots of individual records, it's as 12 good as it's going to get. And I'm not sure that this type of analysis that Arjun is 13 14 speaking of here would be possible with that data. 15 16 Well, be careful --DR. NETON: 17 MS. SMITH: Now perhaps -- well, you know, 18 Martha could be approached to see if there's 19 some other ways to have -- to -- to retrieve 20 the data so that you -- we could get it in a 21 more specific format. 22 DR. NETON: Well, we need to go back and look -23 - I know, for example, that all of the claimant 24 data that we've received from DOE, in general, 25 has been put into workbooks. So presumab --

1 MS. SMITH: Correct, and --2 DR. NETON: -- presum--3 MS. SMITH: -- I actually -- when we were 4 trying to figure out how we were going to 5 assign doses prior to 1957, I had one of the 6 data entry people here go through all the cases 7 with -- claimant cases that had data between 8 '51 and '57 and put it into a spreadsheet, and 9 it's not -- it doesn't have any statistic--10 statistical validity or it's just not strong 11 enough. I can forward that to you if you'd 12 like. 13 DR. NETON: I'd like to see that. Let's --14 let's -- I guess the answer is that we're 15 working on it here and --16 MS. SMITH: Okay. 17 DR. NETON: -- we will get back to you. 18 MR. PRESLEY: Okay. 19 This is a -- this is a real problem DR. NETON: 20 for -- for a number of sites. 21 MS. MUNN: But it would seem your approach that 22 you outlined makes good sense. If you have 23 bioassay, it's not an issue. If you don't have 24 bioassay and do have data from coworkers, then 25 obviously it would be a logical thing to do.

1 CORRECTION FACTORS WITH JOB MATRIX 2 MR. PRESLEY: Okay, 11(e), correction factors 3 have been developed and can be applied in 4 conjunction with job matrix. Chapter 2, we're 5 still waiting on revision six to come out, but 6 I don't see any action on this whatsoever by --7 this is -- could probably be marked complete, 8 pending the revision of the -- of Chapter 6. 9 Mr. Presley, is is -- it is --DR. MAKHIJANI: 10 there -- there isn't any action on the part of 11 the working group, I guess, until -- until the 12 revision is complete. 13 MR. PRESLEY: That's correct. 14 MS. MUNN: Yeah, agreed. 15 MR. PRESLEY: I agree. 16 MS. MUNN: Break time. 17 MR. PRESLEY: All right. 18 DR. ROESSLER: (Unintelligible) on till after 19 break. 20 MR. PRESLEY: Why don't we have a break for 21 about 15 minutes and be back in here at five 22 after 11:00. Is that all right with everybody? 23 DR. ROESSLER: Sounds good.

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MS. MUNN:

Okay.

(Whereupon, a recess was taken from 10:49 a.m.

1 to 11:09 a.m.) 2 DR. WADE: Could I ask those on the line to 3 identify themselves? Who's on the line with us 4 now -- telephone line? 5 MS. HOMOKI-TITUS: This is Liz Homoki-Titus with Health and Human Services. 6 7 DR. WADE: Hi, Liz. 8 DR. MAKHIJANI: This is Arjun. 9 DR. WADE: Hi, Arjun. Thank you for coming 10 back. Cold and rainy here in Cincinnati. 11 MS. SMITH: This is Cheryl. 12 DR. WADE: Hello. 13 MS. SMITH: With the ORAU team. 14 DR. WADE: Good. Is Sandy Schubert on the line with Senator Reid? 15 16 MR. MCDONOUGH*: This is Alex McDonough from 17 Senator Harry Reid's office. Sandy has been in 18 and off the call. 19 DR. WADE: Now we -- we had the matrix sent to 20 Sandy. 21 MR. MCDONOUGH: Okay. I'll let her know that 22 you said --23 DR. WADE: Yeah, so I --24 MR. MCDONOUGH: -- that you sent it and ask her 25 to send it to me.

1	DR. WADE: Okay, if if that's easy for you
2	to do.
3	MR. MCDONOUGH: Yeah, that that's easy to
4	do. We're in the same office.
5	DR. WADE: Okay, good.
6	MR. MCDONOUGH: Thank you.
7	DR. WADE: Thank you for joining us.
8	MR. PRESLEY: Billy Smith, are you there?
9	MR. SMITH: Yes, I am.
10	MR. PRESLEY: All right, thank you.
11	MR. ROLFES: Is Gene Rollins back?
12	DR. WADE: Is Gene Rollins back with us?
13	(No responses)
14	MR. PRESLEY: We want to to bypass 12 then?
15	DR. ROESSLER: Until Gene gets back.
16	MR. PRESLEY: Till Gene gets back?
17	DR. ROESSLER: That might be (unintelligible).
18	MR. ROLFES: That might be a good idea, I
19	think.
20	MR. PRESLEY: I think it'd be an excellent
21	idea. So need to mark it with bypass 12. We
22	bypassed (unintelligible).
23	ENVIRONMENTAL VERSUS OCCUPATIONAL EXPOSURE
24	Okay, 13, environmental dose let's see,
25	guidance in the TBD may not be adequate

1 (unintelligible) exposure. Oh, action on this 2 is revise environmental versus occupational 3 exposure, add quidance to Chapter 5 revision as needed. Mark and Jim, do y'all want to comment 4 5 on what's been done on that? 6 MR. ROLFES: Let's see, Cheryl, do you know --7 have you spoken with Vern Cath-- or I'm sorry, 8 Ron Catherine* or Vern Shockley* about iodine-9 131 venting? I don't know what the status of 10 that is, Cheryl. 11 MS. SMITH: I'm sorry. Ron Catherine has 12 provided some quidance for iodine and it has 13 been incorporated into the revision to the TBD 14 that will be, you know, for OCAS review as soon as it's released or -- I -- I believe it's 15 16 going to go in -- yeah, it's going to go into 17 Chapter 5. 18 MS. MUNN: Chapter 5, good. 19 MR. PRESLEY: So we need to be looking for a --20 a document to be coming out from OCAS. Is that 21 correct? 22 MS. SMITH: Well, it hasn't gone through 23 internal review at this point, so I don't know 24 what the time line is on that. Is there a --25 is it part of one of the Gantt charts, Mark, do

1 you know? 2 MR. ROLFES: I'm not certain. 3 MS. SMITH: Okay. 4 MS. MUNN: But that Chapter 5 revision is 5 essentially done. It's -- again --6 MR. ROLFES: Yeah, it -- it sounds like --7 MS. MUNN: -- it's just waiting --8 MR. ROLFES: -- the work has been completed, 9 we're just awaiting for final review and 10 approval. 11 MS. MUNN: Right. 12 DR. BEHLING: Is there concern about other radioiodines besides 131? Arjun? 13 14 DR. MAKHIJANI: You know, I -- I cannot 15 remember if we've raised that in -- in our site 16 profile review. Let me look at it. I don't --17 I don't remember. These -- these comments get 18 awfully narrow in the matrix and so it's hard 19 to keep track of it without going back. 20 - you can go on with the discussion. I'll look 21 at it and then --22 DR. BEHLING: Yeah, because if it's -- if -- if 23 it's around (unintelligible) fresh fission 24 product inventory that's being vented, going 25 back to my work that I just completed -- as you

know, work for the CDC -- on that issue in the Marshalls, the people's exposure who were close to BRAVO, when you look at the thyroid doses, the iodine 131 for those closest to -- to Test BRAVO were actually only one-sixth of the total thyroid dose from the other iodines -- 132, 3, 4 and 5. So in essence, you may be overlooking a larger dose from shorter-lived radioiodines if you focus on iodine-131, depending on the age of the -- the release.

DR. MAKHIJANI: Yeah, I -- I don't see that we raised the other iodines, at least in this finding. It may be -- are you thinking of what, 135 or --

DR. BEHLING: Well, yeah, they -- they range from -- from, you know, a short -- 20 minutes to 20 hours. But as I said, the yield for some of the other iodines is higher and therefore giving you a differential higher dose. As I said, I'm going now on the work I'm doing for the Marshall Islanders, and some of their exposures on Rongelap -- the total thyroid was actually six times higher from the others than it was for iodine-131 by itself.

DR. MAKHIJANI: Yeah. No, I -- we may not have

1 raised this. It may have slipped through a 2 crack here. MS. MUNN: Well, how -- how does --3 4 MS. SMITH: This is Cheryl. Ron's writeup 5 includes most of the short-lived daughters, so it's -- it's not like it is just addressing 6 7 iodine-131. 8 DR. BEHLING: Yeah, and --9 DR. MAKHIJANI: Oh, great. 10 DR. BEHLING: -- tellurium comes into play here 11 because you will see iodine decaying --12 tellurium decaying into iodine. Now how -- how is this item 13 MS. MUNN: 14 particularly different than comment one? 15 Because in comment one, you know, where we 16 started from this site was with a list of 17 radionuclides that SC&A felt had not been 18 addressed. And I thought we were going back 19 and pretty much covering the waterfront on 20 everything. The 131 came up as a question of 21 venting, I think, but were these -- were the 22 iodines and the other short-lived isotopes that 23 are of concern in this item not covered in the 24 big, broader issue with Table 1? Do -- do we

know, because I don't have the original table

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1 in front of me. 2 DR. BEHLING: I don't know. In fact, I'm not 3 even familiar with (unintelligible) --DR. MAKHIJANI: Oh, Ms. Munn --5 MS. MUNN: Yeah. 6 DR. MAKHIJANI: Ms. Munn, this is Arjun. 7 I think that this finding was in the context of 8 environmental dose and workers who may not have 9 been monitored, and how environmental dose from 10 ventings was going to assigned. So it was a 11 rather specific thing rather than a more 12 general discussion of which radionuclides were 13 relevant at the test site as a whole. 14 MS. MUNN: Okay, so this -- this would be case-15 dependent then. 16 DR. MAKHIJANI: Yes. 17 MS. MUNN: Yeah. 18 DR. MAKHIJANI: So for unmonitored workers who 19 didn't have the internal monitoring for iodine 20 in cases of venting. 21 MS. MUNN: Okay. Thank you. 22 (Unintelligible) MR. CLAWSON: 23 MR. SMITH: Arjun, this is Billy Smith. 24 a question regarding what you mean by 25 unmonitored workers. Are you talking about

1 workers who did not submit urine samples? Well, workers who did not 2 DR. MAKHIJANI: 3 submit urine samples or, in the case of iodine, 4 presumably the thyroids were not monitored in 5 case they were in the path of a plume or 6 something like that. 7 MR. SMITH: So it's -- it's either a direct 8 thyroid counting or were not bioassay sampled -9 10 DR. MAKHIJANI: Yes. 11 MR. SMITH: -- is your definition of an 12 unmonitored worker in this case. 13 DR. MAKHIJANI: Yes. 14 MR. SMITH: Okay. 15 MR. PRESLEY: Okay, what I put down on that was 16 working group will review when revision to 17 Chapter 5 comes out. Again that's one of these 18 ongoing items. Everybody agree? 19 DR. MAKHIJANI: I beg your pardon, Mr. Presley? 20 MR. PRESLEY: Arjun, what I put down was 21 working group will review when revision to 22 Chapter 5 comes out. 23 DR. MAKHIJANI: Right. 24 MR. PRESLEY: Okay? 25 DR. MAKHIJANI: Yes.

1 NO INTERNAL MONITORING DATA UNTIL LATE '55 OR '56 2 MR. PRESLEY: All right. Comment 14, there's 3 no internal monitoring data until late '55 or 4 '56. Some plutonium from then on some -- some -- I guess that's "and" -- and some tritium 5 6 from 1958 plutonium, tritium and mixed fusion products. This has to do with item 5, which 7 8 Gene is not here. We have not discussed this 9 yet. 10 MR. ROLLINS: Bob, I'm back on the line now. 11 MR. PRESLEY: Great. 12 MS. MUNN: Just in time. Thank you, Gene, for joining us. 13 DR. WADE: 14 Hey, Gene, have you moved in yet? MR. PRESLEY: 15 MR. ROLLINS: I'm now a proud homeowner once 16 again. I'm going to be moving on Friday, thank 17 you. I never saw so many papers to sign in my 18 life. 19 MR. PRESLEY: Well, thank you for coming back. 20 We appreciate you very much. 21 Does anybody have any comment on 14, or do we 22 need to, since Gene's here, go back and -- and 23 try to pick up five and -- and 12 before we go 24 on? 25 DR. ROESSLER: Seems like we should go back to

1 five, start there. 2 MR. PRESLEY: Gene --3 MS. MUNN: The only thing I would ask is that 4 we kind of take a quick look at the other items 5 that we haven't addressed yet today to see how 6 many of those are incorporated in that Chapter 7 5 revision so that we don't have to keep going 8 back to it. 9 Well, we know 14 is. MR. PRESLEY: 10 MS. MUNN: We know 14 is. 11 MR. PRESLEY: And let's see --12 MS. MUNN: We have -- 18 is. So is 17. 13 MR. PRESLEY: Right. 14 MS. MUNN: And there -- I thought there was one 15 other -- no, there are two others, 23 --16 MR. PRESLEY: 23 and 24 -- no, 23(b). 17 MS. MUNN: -- 23(b), yeah. 18 MR. CLAWSON: This is Chapter 4 -- right? -- or 19 Chapter --20 DR. MAKHIJANI: Are we talking about things 21 that relate to comment number five, the 22 resuspension model? 23 MR. PRESLEY: Right, what -- what we were going 24 to do, Arjun, since Gene's back, is go back and 25 start on five. 'Cause I think by doing that we

1 may ask -- answer some questions for some of 2 these later issues. 3 RESUSPENSION MODEL Five has to do with the resuspension model and 4 resuspension factors, and Gene, are you ready 5 6 to discuss this with us --7 MR. ROLLINS: Yeah, we can start talking about 8 this. 9 MR. PRESLEY: -- (unintelligible) your finding, 10 sir? 11 MR. ROLLINS: I've done several things. Number 12 one, Dr. Anspaugh provided me with his perspective on what the problems are associated 13 14 with, number one, my model -- my resuspension model. And he also provided some information 15 16 about some of the items we should consider in 17 doing dose reconstruction regarding resuspended 18 contaminated material. Has the Board had an 19 opportunity to read this paper? 20 MS. MUNN: I have not. 21 MR. PRESLEY: Me either. 22 DR. MAKHIJANI: Ms. Munn, it was sent -- it was 23 sent out somewhere in the first part of 24 October. It's dated October 8, 2006.

DR. ROESSLER: I've read it, and I see I have

25

1	lots of little tabs on it, but I haven't
2	revisited it so I think I'd have to do some
3	studying.
4	MR. PRESLEY: Oh, I have read that, too.
5	DR. ROESSLER: Maybe you can point out
6	pertinent things in it.
7	MS. MUNN: Okay.
8	MR. PRESLEY: Yeah, I've probably got it on
9	here.
10	MS. MUNN: How would I have filed that?
11	DR. ROESSLER: One of the notes I have is it
12	says need we need to have NIOSH and SC&A,
13	along with Lynn Anspaugh's input, do some give-
14	and-take at a workgroup meeting. Maybe this is
15	it.
16	DR. MAKHIJANI: Yeah. Dr. Anspaugh I think is
17	in Tahiti, but
18	DR. ROESSLER: We could all go there with
19	MR. ROLLINS: Yeah, I wish I was with him.
20	DR. MAKHIJANI: He said he was having a good
21	time.
22	MS. MUNN: Maybe we should all go over and
23	discuss this with him.
24	MR. ROLLINS: I could speak in some general
25	terms about some of the items that he has

brought up. And first of all, I would preface all my remarks by saying that I don't disagree with -- with any of the technical issues that - that Dr. Anspaugh has -- has brought up.

These are -- these are things that we have all thought about, but we have also tried to -- to work towards a workable solution. And my -- my original attempt was to try to come up with a method that would provide something that we could hopefully agree on would be a reasonable overestimate or a reasonable underestimate, depending on how we intended to use the -- the material.

One thing I did do was go back and develop a mass loading model based on full* contamination data and mass loading factors that we -- that are available for the Nevada Test Site. What -- what my simplified -- and I will call it a simplified mass loading model -- did not take credit currently for any decay of short-lived radionuclides, which was one of the major concerns that Dr. Anspaugh voiced in his paper.

MS. MUNN: Uh-huh.

MR. ROLLINS: That can be done.

DR. ROESSLER: Yeah.

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MR. ROLLINS: It becomes somewhat more difficult when you consider that there were multiple episodes that each one would have to be handled as far as decay correction differently and you can -- you can begin to see how complicated it could be. But I think there are some things we can do to simplify these calculations by doing some bounding calculations.

He has provided a list of radionuclides which he says are important 21 hours after a detonation. And one thing that I -- that I could do that would not take an unreasonable amount of time would be to go through these radionuclides, compare them with their relative abundance and their importance to dose -taking those two factors together, I could -- I could screen these to see where the potential dose is coming from. And I think, hopefully, we could all agree that if I can demonstrate that we're capturing 90 or 95 percent of the radionuclides that contribute significantly to dose, then maybe a lot of these would drop out and the problem would become a little more tractable. I think I could do that in a

reasonable amount of time. Because a lot of
these radionuclides are short-lived, I don't
think their contribution to dose is going to be
of much significance. But we need -- as he

pointed out in his paper, we need to show that

to be the case.

Back to my mass loading model, you may remember in a previous discussion that we had I had average and maximum intakes based on my resuspension model currently in the TBD. The average intakes were kind of small and really of no dose significance. I think my original proposal was well, we can use those in a case where an individual is clearly compensable 'cause it won't make any difference. The maximum intakes, on the other hand, that I originally provided from my resuspension model are a couple of orders of magnitude higher than the average, and I felt like that that would provide a reasonable overestimate.

Well, in going back and applying a sitespecific mass loading model, what I've learned
is that my original maximum intakes in
becquerels per year would actually increase by
a factor of ten over what I had previously had

as a maximum intake. Now that's with no decay correction, but I think what we can do, because the relative dose is fairly small -- in fact it's very small, because -- and I think -- I don't -- I don't remember whether I gave you -- it seems to me that I provided these numbers for you in a previous --

MR. ROLFES: Gene, that's correct. This is

Mark Rolfes. I do have -- I believe for the

August 8th call -- I take that back. Back in

July you did provide some dose tables

illustrating the maximum intake in associated

doses to various organs, and then the factor of

ten higher as well.

MR. ROLLINS: Yes. In fact the example that I used to illustrate this was my assumption was that an individual had ten years of the maximum intake values provided in the table, and the doses that I provided in the table were actually 30-year integrated doses. And I also provided a table that showed what would happen if you increased these doses by a factor of ten, which is -- which would, by -- I guess by accident, look very much like my current mass loading propos-- loading model proposal. And

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what it shows is that, with the exception of the respiratory tract organs and the case of the liver for uranium and bone surfaces for plutonium, the consequences to other organs in the body is very small. We're talking several millirem to maybe as much as 300 millirem. That's for ten years of exposure. So that helps to -- helps you, hopefully, to get an idea of the magnitude of the problem and what potential effect that it would have on a probability of causation, for example. Now in the case of lung, for example, if you used my current proposed, simplified mass loading model -- which would give us ten times the intakes that were previously published in the TBD as maximum intakes -- ten years of exposure at a 30-year dose to the lung would work out to nine and a half rem. Now from my experience in using IREP and determining probability of causation, for an individual with a reasonable amount of latency period -which is typically ten to 15 years -- and for a previous smoker, which in my experience, 99 percent of the Energy employees were previous -- former smokers, it takes about 60 to 65 rem

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problem.

to exceed 50 percent probability of causation. So another nine rem from resuspension could be important to determining compensability. Doses to the ET-2 region and the LNET regions are even higher than that. They would run about 20 -- 16 and 20 rem, respectively. But some of those cancers associated need much more dose than that to go compensable. So I guess I've kind of, in a way, outlined where we are as to the importance or potential importance of resuspension. And now I -- now I'm really at a loss as to where we should go from here, how much resource should be expended because, you know, this is a problem that if you -- we can't know all the variables. can't know where a person was. We can't know what the atmospheric conditions were at the time that the individual was there. lot of uncertainty in this. But as I pointed out, there are a few cancers that could be affected if we become too claimant-favorable. And so I can open this up to discussions and maybe we can get some ideas of what a reasonable path forward would be for this

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DR. ROESSLER: Well, Gene, I think the comment that's shown in the matrix about the working group expressing concern about how significant the impact was to go through all of this was mine, because I remember that table -- I don't have it in front of me now, but there were huge negative exponents in some of the doses, and you've just verified that for most of the organs it's on the order or maybe millirem and -- at a maximum calculation. So my -- my concern at that time was that a great deal of resources and money be expended on this, when there'd probably be more important things to be working on. But you now brought up this dose to the lung as a potential one that could be important, so I -- right now I'm not sure, either, where we should recommend you go on it. MR. ROLLINS: Well, I can throw out some ideas, and maybe we can discuss the acceptability of some of these ideas. For example, at Hanford we have situations where we had construction workers that were not monitored, so we developed a coworker study that would allow us to assign intakes of various radionuclides, based on those people that were monitored --

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based on that experience. And then we said, because of some uncertainty, we can -- we can double that, and we're currently doing that at Hanford. There were, I suspect -- and maybe Billy could comment on this, but there were probably a fair number of people who were -had a potential for being exposed, but were not on a bioassay monitoring program. course this whole premise of this environmental -- occupational environmental chapter is that there were people out there walking around being exposed that nobody ever really gave it much thought. But maybe Billy did give it a lot of thought, I don't know. Maybe Billy has some thoughts on this that could help move this discussion forward.

MR. SMITH: Well, Gene, let me make a comment here. Of course all of you have been to the test site and know the size of the area that we're talking about. And of course you know everybody was monitored with external dosimeters. We only did internal monitoring, either bioassay sampling or whole body counting, on a select subset of people, primarily the radiation safety personnel.

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Hence the RCTs, radiation monitors, health physicists, industrial hygienists who worked in radiological areas.

We also chose another subset of people that we

monitored, which were the WSI guards, those had permanently-assigned stations, and also the rolling guards because they were all over the test site all of the time. And based on the kinds of data that we got from doing the bioassay sampling and whole body counting of these individuals, then you could probably come up with some -- some -- use these as a study to do a coworker model for those people who were not sampled and not whole body counted. But I can tell you right now that the number of positive doses or exposures that you would get from people that -- from the two subsets that we sampled were extremely, extremely small. And the other thing that we had that nobody's seemed to mention today is that we had a 24/7 environmental surveillance program where we air sampled the air over the entire test site. had several hundred environmental air samples that were running 24 hours a day, and those were analyzed on a quarterly -- monthly and

quarterly basis using very large volumes of air, and we were able to measure what the plutonium concentrations were and the fission product concentrations were in the environmental air. And these concentrations, again, were extremely low. All this is documented in the NTS environmental reports that are published.

MR. ROLLINS: This is Gene Rollins. Billy, thank you for that. Also included in the TBD Chapter 4 is a summary of the atmospheric monitoring data. And as you said, Billy, even using maximum values based on actual empirical data that these monitors provided, it does not support these maximum intake values that I -- that I have proposed. In fact I said that in the TBD, that we need to be careful because the actual empirical data does not support this model data, and I gave reasons for that, mostly just claimant-favorable assumptions in the development of the model.

Now one of the concerns of Dr. Anspaugh is that these averaging values that we get from these monitors may not be reflective of what an individual could have been exposed to had he

been in the wrong place at the wrong time, for example. But now that's the very example of a situation that we -- we could probably never know whether this individual was in the wrong place at the wrong time. And if we make the assumption that everybody was in the wrong place at the wrong time, then I think we may be going a little bit too far in the claimant favorability arena.

MS. MUNN: This gets outside of being claimant favorable and gets into reputation of known data, of good science and certainly of any epidemiological study that could support any such thing -- which of course we're not allowed to utilize. But nevertheless, it's of real concern to a few of us on the Board that we not get outside the arena of good science or of available data. So this appears to be a little bit like some of the programs that have been put together to try to incorporate all the variables to compute global warming. We're just -- we have to be really reasonable and be cautious, I think. The effort that you folks put into it is admirable, because it appears to some of us that it's a real effort to be as

specific as possible. That's genuinely appreciated.

Conversely, if the effort is going to lead us to consequences that are very small, then some of us have a real need to question that. So thank you for what you're doing, but your -- your concerns over claimant favorability falling past the point of reason and into overconcern is very well-taken here.

MR. ROLLINS: This is Gene Rollins again.

Moving -- beginning to talk again about the potential for a coworker study, what Billy says has certainly been my experience, is that there are very few positive bioassays at the Nevada Test Site. So if we were to develop a coworker study and try to assign dose, then my suspicion is it's going to be driven largely by less than MDA values.

Now for the fission products, that does not result in any significant dose. However, for plutonium and uranium, and for a select few radionuclides, assigning missed dose does result in some significant organ dose. But that's one way we could do that, and we might be able to make some justification for reducing

1 those numbers. But that's one approach that 2 we could use. We've used that at other sites, 3 and so there is precedent for it. MS. MUNN: Precedents are always one of the 5 things that are of concern, I think, especially when the circumstances vary so widely from one 6 7 site to another. So making a decision to, in 8 all cases, assume that there are large missed 9 doses for the claimants may fall outside the 10 realm of reason. It would be difficult to 11 justify that, I think. In a truly scientific, 12 peer-reviewed program it would be, I believe, difficult to justify making that assumption 13 14 with a broad brush. 15 This is Arjun. Gene, why --DR. MAKHIJANI: 16 why are you not using the T* to the minus 1.2 17 reduction to decay the -- first you correct and 18 go back using the X tables, but then -- you 19 can use a correction for decay so you don't 20 come up with numbers that don't have -- you 21 know, that don't -- that don't have sort of 22 physical reasonableness. 23 MR. ROLLINS: Could you excuse me for just one 24 second? I'll be right back with you. 25 DR. ROESSLER: What's he talking about, Hans?

1 Is that a --2 DR. BEHLING: No, the -- Arjun the Hicks table 3 -- for instance, if you're looking for a time 4 20 hours past the detonation, the Hicks tables 5 give you exact citation of both activation and 6 fission products. DR. MAKHIJANI: Yeah, I realize that, Hans, but 7 8 what I'm saying at that point if you can 9 calculate a gamma dose, why can't you then use 10 a T to the minus 1.2 to correct that as time 11 goes on? 12 DR. BEHLING: Well, in fact --13 DR. MAKHIJANI: But this is resuspension. 14 sorry. Yeah, okay. 15 DR. BEHLING: No, the Hicks tables actually 16 give it to you in terms of MR per hour, and 17 then you can determine, based on time interval 18 -- you can scale -- as you and I talked 19 yesterday, I'll show you how to use the Hicks 20 table. 21 MR. ROLLINS: As I said -- this is Gene Rollins 22 again. As I said, there are methods that we 23 can decay-correct, but it becomes very complex 24 if you try to decay-correct for the multiple 25 events. The reason -- the approach that I took was based on the data that was available. As Billy said, when the environmental reports started in the late '60s and early '70s, there was a plethora of air sampling data. I could find nothing of any use prior to that. Prior to that they were mostly interested in what the conditions were actually in the plume, which is not the conditions that people were exposed to, so it was very difficult to try to move back in time.

I still believe, based on what I believe a screening analysis will tell me, is that the short-lived isotopes I do not believe are going to be large contributors to organ dose compared to the other -- cesiums, the strontiums, the uraniums and the plutoniums. Plutonium data of course, because of security reasons, a lot of that data was not available. You won't find that sort of thing in the Harry Hicks reports. Dr. Anspaugh does provide a recommendation about how to get there by using ratios of cesium. Again, additional complexity, many variables to consider over time. It's just a matter of where are we going to expend resources.

1 MR. PRESLEY: How many cases are we talking 2 about here -- this would -- get into? 3 MR. ROLFES: There's approximately what -- the 4 total number of claims that we have for Nevada 5 Test Site I believe is around 1,300 claims. 6 MS. MUNN: Uh-huh, and we've probably processed 7 a number. 8 MR. ROLFES: Yes, so I would have the number 9 available right now. Maybe -- is there anyone 10 available to check to see the number of claims 11 Is there that we have completed in NOCTS? 12 anyone on the line that might have access to 13 NOCTS? 14 MR. SUNDIN: Mark, this is Dave Sundin. 15 you'll give me a minute I think I can get that 16 for you. 17 Great, thank you, Dave. MR. ROLFES: 18 DR. ROESSLER: While he's doing that, I'd like 19 to address a question to Arjun. In view of the 20 discussion, the things that Gene has said about 21 the importance of -- or the impact of this on 22 the doses and also Billy's comments about the 23 whole body counting and the atmospheric 24 monitorings, do you think many people would 25 have slipped through the cracks? Have you

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changed maybe your impression on this, that this maybe is not deserving of a great effort? DR. MAKHIJANI: I don't -- I don't know how to answer that because I don't know how the claims fall out. I think from -- take from what Gene was just saying, I think maybe it might be more relevant to the pre-1970 years than the post-But I'm not sure. 1970 years. I'm not sure. DR. NETON: This is Jim Neton. It seems like there's no really (unintelligible) that the working group can come up with as far as direction on this, and I -- Gene has proposed a couple of alternatives. And I would suggest that we, NIOSH, need to go back and deliberate this among ourselves and pick a path forward and then throw out the reasons why, you know, we chose to do that and bring it back. Gene's bounding analysis without decay correction has merit. I think we need to discuss how much extra work there would be to decay-correct these values to get a more reasonable number, and is that effort worth it. And if not, then it may be that that's our best estimate and we'll have to live with it. But I think this -- maybe the ball is in our court

here now to come up with a recommendation to the Board -- the working group.

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MS. MUNN: I would also like to see this investigation limited to the radionuclides that one would reasonably expect to be significant There seems to be no legitimate contributors. reason for including minuscule contributions which, added all together and taken in a lump, are not going to make significant changes to a POC in any case. And if we could just simply get past the concept of trying to account for every single radionuclide that could have been even a minor contributor -- if we could even get past that point it would seem to me that you would have a better way to proceed. don't know how the other Board members feel about that, but it would just seem wise to me that the first step would be to eliminate apparently insignificant contributors and focus on only what you can -- what we all know are the real problems.

MR. ROLLINS: This is Gene Rollins again. Dr. Anspaugh did provide in his paper, Table 3, a list of 38 radionuclides that in his expert opinion -- has all the ones of, as he puts it,

relatively greater prominence at 21 hours after
the SEDAN event.

MS. MUNN: I see that, and those seem to be --

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that seems to be a pretty thorough listing, to me. As a matter of fact, even that seems to be extensive.

MR. ROLLINS: Well, I would like to point out that of the 38 listed there only 14 are currently in our version of IMBA, so we could not even generate annual doses for many of these using our approved methods. However, having said that, many of these are so -- short half-life that effectively all of the dose administered would be in the first year of the intake anyway, so that's not an intractable problem. I think doing a screening analysis on these 38 would be of interest, and that would be simply looking at the relative abundance at 21 hours and comparing that to the various dose conversion factors -- organ dose conversion factors, and then we can figure out which of these 38 contribute the majority of a dose.

MS. MUNN: That seems eminently reasonable to me, especially in view of the fact that I see that this table even includes a number of the

other iodine isotopes that we were discussing earlier in another context. Even those are there. So I'd really like to narrow this down to where it becomes a workable thing for NIOSH, and have us all agree that this is not going to throw people way underneath any reasonable POC that they would otherwise have had.

MR. ROLLINS: There is one -- this is Gene
Rollins again. There is one serious problem,
as I see it, with this list. And that is some
of the really bad actors are not here, and that
is for security reasons.

MS. MUNN: Uh-huh.

MR. ROLLINS: (Unintelligible) 239, 238, uranium-234, 238, those -- those radionuclides are not in this list, and that was not by accident. That was by design. And so to do any comparative analysis to determine which of these radionuclides provide most of the dose, we have to include those, and somehow we have to get a handle around them without violating classification issues.

MS. MUNN: Yes, I can see that. And how to approach that I see as a larger issue than choosing which of the nuclides on the table are

1 the greatest considerations. Is there --2 perhaps this is one of those cases where 3 atmospheric data might be of value. MR. SMITH: This is Billy Smith. I believe so. 5 We -- the environmental reports do contain concentrations of what the plutonium 6 7 concentrations were at the various sampling 8 locations on site, and you may be able to 9 correlate that data to the other fission 10 products like strontium and cesium that are in 11 Dr. Anspaugh's report. 12 MS. MUNN: That's a possibility, that it seems 13 much more reasonable to begin to approach it 14 from that direction. 15 This is Gene Rollins again. MR. ROLLINS: 16 was -- Dr. Anspaugh did mention that there --17 there may be a way, by ratioing --18 MR. SMITH: Yep. 19 MR. ROLLINS: -- the more recent data ratios of 20 cesium to plutonium than -- that way we may be 21 able to go back and infer something about what 22 the relative abundance of plutonium would be to 23 these other radionuclides that he's listed in 24 Table 3. However, now -- if we get it right, 25 now we have generated a classification problem,

1 and that information would not get through 2 derivative classifiers. 3 MS. MUNN: So we have a catch-22 here. 4 MR. ROLLINS: Do you think I'm incorrect on 5 that one, Billy? MR. SMITH: Well, you know, we cleaned up 6 7 Enewetak and we made gamma measurements on Enewetak with the IMPs, the planar germanium 8 9 detectors, by looking at primarily cesium and 10 americium photons in the soil there, and we 11 were able to infer what the plutonium 12 concentrations were because chemical analysis 13 for plutonium was just too expensive. It seems 14 to me that if you looked at the model that was 15 used at -- for the Enewetak Atoll cleanup and -16 - I don't know whether any of you have read 17 that report, but it's a -- it would take you 18 two years to read it, it's so big, but anyway, 19 there --20 DR. BEHLING: I read it. 21 MR. SMITH: -- there is a good model in there. 22 MS. MUNN: Hans has read it. 23 MR. SMITH: Okay. There's a good model in 24 there that would allow you to infer what the 25 plutonium concentrations could be. And I think

1 that's -- to me, that's what you're trying to 2 come up with with a model is what is a 3 reasonable concentration for the, if you will, 4 classified isotopes -- and I don't mean the 5 classified plutonium is a classified (unintelligible) per se, but you could come up 6 7 with some numbers for plutonium -- if ingested, 8 what would the dose consequences from those be. 9 MR. ROLLINS: Okay, this is Gene Rollins again. 10 Dr. Anspaugh took me to task over a statement 11 that I made that -- rightly so -- that most of 12 the contamination out there was from above-13 ground tests. He says that's not the case. Не 14 said -- he makes the case that most of it was 15 from venting --16 MS. MUNN: Your ground vents, yeah. 17 MR. ROLLINS: -- and like the PLOWSHARE, and I 18 don't -- I don't disagree with that because 19 what I've been told is that --20 MR. SMITH: Gene --21 MR. ROLLINS: -- for the atmospheric tests --22 MR. SMITH: Gene, I disagree with it. I don't 23 -- I don't believe -- Lynn Anspaugh and I 24 worked a lot together. I processed a lot of 25 his samples through my laboratory there in

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Mercury, and I disagree that most of the contamination that's on the ground there is due to underground testing. No.

Most of the -- particularly the heavy stuff, the plutonium and uranium, would have been laid down as a result of atmospheric testing and from some of the PLOWSHARE shots, but there were not that many of those. SEDAN was one, BUGGY was another one -- I can't think of the names of some of the other PLOWSHARE shots. But the plutonium areas -- there was an area out there we called Plutonium Valley and -which is fenced and the access to those areas are controlled. You have to get permission from DOE Operations to enter and you have to sign an entry log, and you come out and you sign an exit log which gives you a stay-time for the people that are in there. You're not allowed to get off the road while you're in those areas. The RCTs are very, very aware of the potential that exists in working in those areas and they apply, you know, their everyday rules to make sure that people are not contaminated and don't get exposed or get an intake.

I can tell you also that as of today they do not go into those areas without knowing that there's a -- there is contamination there.

They're required to read the postings and wear appropriate PPE while they're in those particular areas.

So I don't know what Lynn took you to task over about where this contamination comes from, but in a venting -- one of the great things about a venting is that the -- the fission product gases or the gases -- the stuff that's coming out of the ground goes through several hundred feet of soil and stemming materials before it reaches the surface. Most of the stuff that gets out is not plutonium or uranium.

MS. MUNN: Uh-huh, yeah.

MR. SMITH: Because it's scrubbed by all the material that's above it before it gets out. So you've got the uraniums -- I'm sorry, the iodines that comes out and the xenons that come out, rhodium, ruthenium, all of those types of things and -- and some europiums.

DR. MAKHIJANI: But I -- I have Dr. Anspaugh's paper right in front of me. I think he said something a little bit more precise, is that

1 the -- the maximum values of contamination were 2 in Area 30, associated with the Test BUGGY. 3 And then the next higher values of 4 contamination are associated with Area 20, 5 which was the scene of cratering experiments. 6 So I think he -- he said something rather more 7 precise than what we're attributing to his 8 paper. 9 MR. ROLLINS: This is Gene Rollins again. 10 think what I'm hearing is that NIOSH will take 11 an action to develop a model that we will bring 12 back to the Board, with justification for why 13 we believe it is adequate. I think we could --14 we could debate this the rest of the day. 15 DR. NETON: Right. I think this discussion's 16 been helpful, though. It has been, but I think -- it's 17 MR. ROLLINS: 18 been helpful in identifying how we may move 19 forward on developing a model. 20 DR. NETON: Exactly. 21 And I think we've got an action MR. ROLLINS: 22 now to go out and do that and provide the Board 23 with justification as to why we believe it is 24 appropriate and adequate for dose 25 reconstruction.

1 DR. NETON: Right. 2 MR. PRESLEY: Okay, this is Bob Presley and 3 I've got it down that NIOSH will look at the 4 problem and come up with a recommendation to 5 the Board. 6 That concludes five, and we -- let's see, what 7 else did we bypass, did we bypass 12? Is that 8 what it was? 9 DR. NETON: And six and seven. MR. PRESLEY: Six and seven? 10 11 DR. MAKHIJANI: Six goes with five, Mr. 12 Presley. 13 MR. PRESLEY: Right, right. 14 DR. MAKHIJANI: I think the next one is 12. 15 MR. PRESLEY: That's what I was thinking. 16 we want to break? It's five after 12:00. 17 lot of us have been up since 4:00 o'clock this 18 morning. Do we want to bypa-- or break right 19 now at 12:00 and -- what's a reasonable time 20 for lunch, 45 minutes or an hour? 21 DR. WADE: Yeah, I think aim at -- aim at ten 22 of and we'll start at 1:00. 23 MR. PRESLEY: Is that all right with everybody, 24 ten of? Be back in here and we'll try to knock 25 this out by 3:00 o'clock.

1	DR. MAKHIJANI: Mr. Presley, might I be excused
2	after because I have to go to the hearing.
3	MR. PRESLEY: Only if you tell us what went on
4	at the hearing.
5	DR. MAKHIJANI: I will make notes if you like
6	and and I will I will tell you what went
7	on. I'll send you all an e-mail. How about
8	that?
9	MR. PRESLEY: Thank you, Arjun.
10	DR. MAKHIJANI: Okay. I'll be happy to be your
11	rapporteur.
12	MS. MUNN: I'd like to know if those folks ever
13	get any information at all about how much
14	really has been done. That'd be nice.
15	MR. ROLFES: This is Mark
16	DR. MAKHIJANI: Yeah, well, I'm not testifying,
17	so
18	MS. MUNN: Yes, I know you're not.
19	DR. WADE: I told them that. So we're going to
20	break here we're going to break the phone
21	line and we're going to dial back in at
22	ostensibly ten minutes of 1:00.
23	MR. ROLFES: I did want to check with the ORAU
24	the ORAU team members to make sure that they
25	are available for this afternoon following our

1	break.
2	MR. ROLLINS: This is Gene Rollins. I'll be
3	back on the line.
4	MR. ROLFES: Okay.
5	DR. MAKHIJANI: Hans, can you give me a buzz,
6	please, at home?
7	DR. BEHLING: Okay, what's your number there?
8	I don't have my telephone
9	DR. MAKHIJANI: 301-365-6723. Did you get
10	that?
11	DR. BEHLING: Yes.
12	DR. WADE: Okay, we're going to break contact
13	now.
14	DR. MAKHIJANI: Thank you.
15	DR. WADE: Thank you all.
16	(Whereupon, a recess was taken from 12:05 p.m.
17	to 1:00 p.m.)
18	DR. WADE: Again I would ask, just for the
19	record, are there any Board members on the
20	line? Any Board members joining us by
21	telephone?
22	(No responses)
23	Okay, so we don't have a quorum. We can
24	proceed.
25	I'm sure those of you out there will identify

yourself as the discussion goes on, unless someone is very anxious to have themself identified as being on the line.

(No responses)

RADON DOSE IN THE G TUNNEL

MR. PRESLEY: Okay, we're getting ready to start back again. This is Bob Presley with comment 12, has to do with radon dose in the G tunnel, and it says that they're not favorable to the Gravel Gertie -- not favorable Grav-not -- claimant -- not claimant-favorable, and then it talks about Gravel Gertie and radon doses.

MR. ROLLINS: Yes. I can tell you that I will accept the 0.16 working level for G tunnel.

I've already prepared a revision to go into the TBD that will reflect that. I have also received information on the Gravel Gerties from NIOSH and I am evaluating that and, as appropriate, I will include instructions to the dose reconstructors about how to account for radon in Gravel Gerties.

MS. MUNN: Good.

MR. PRESLEY: Tell me a question. I thought

1	I'd been everywhere on that test site. Where
2	is there any Gravel Gerties?
3	MR. ROLLINS: I think Billy could probably
4	answer that question better than I.
5	MR. SMITH: Well, they were I think it's
6	Area 6, just south of (unintelligible) to the
7	west of the Mercury highway, over in the area
8	where the new DAF is located.
9	MR. PRESLEY: Oh, okay. These were were
10	used in experiments in early, early days.
11	Right?
12	MR. SMITH: I'm not sure what they were used
13	for other than for weapons storage and weapons
14	work.
15	MR. PRESLEY: Okay, yeah. Right.
16	MR. ROLFES: The Nevada Test Site did approve
17	the design of the Gravel Gerties.
18	MR. PRESLEY: Right, right, yeah, okay.
19	MR. ROLFES: They did test it, so
20	MR. PRESLEY: That's what it was there, yeah.
21	We actually didn't build any of them, though.
22	Okay, I'm I thank you.
23	MS. MUNN: So did I understand you correctly,
24	Mark, they were designing the Gravel Gerties.
25	MR. ROLFES: They were testing it to make sure

1	it would hold up to a blast and confine
2	radioactive material, so
3	MS. MUNN: Yeah, okay. So in effect there was
4	not a great deal of work that went on there.
5	They designed them, tested them once or twice
6	and went away.
7	MR. ROLFES: Correct.
8	MS. MUNN: So we're not talking about an issue
9	here that would involve either any appreciable
10	part of the site or any appreciable number of
11	individuals
12	MR. ROLFES: Correct.
13	MS. MUNN: ever. Okay.
14	MR. ROLFES: That's right.
15	MR. PRESLEY: Right.
16	MS. MUNN: Thank you.
17	MR. PRESLEY: Thank you very much. What about
18	12(b)?
19	MR. ROLLINS: I'm not really sure why that
20	one's not shaded, either, Bob, because I have
21	agreed to implement the .16 working level
22	MR. PRESLEY: Okay.
23	MR. ROLLINS: prior to 1985.
24	MR. PRESLEY: Okay. Can we deem these no
25	further action by the Board by the working

1 group, I mean? 2 MS. MUNN: Just a follow-up to see if it goes 3 in the revision. 4 MR. PRESLEY: Right. Okay, let's see, 12(c), 5 what about it? 6 MR. ROLLINS: I'm not really sure how that's 7 different from (a), but --8 MR. PRESLEY: That's fine. It's all the same 9 thing. 10 MS. MUNN: Just the comment about Pantex, I 11 quess. Are we -- is that a -- is that a 12 necessary thing, to review the -- well, no, (unintelligible) --13 14 DR. ROESSLER: I think that --15 MS. MUNN: -- do it. 16 DR. ROESSLER: I think that, because Pantex has 17 data, they're going to compare the soil type to 18 Pantex to see if that data is appropriate for 19 use at NTS. It sounds good to me. 20 Am I to take it that we actually DR. NETON: 21 have no Gravel Gertie monitoring data at NTS? 22 MR. ROLFES: Not that I've located. I haven't 23 looked specifically for it, but I don't know --24 Gene, do you -- have you seen any specific air 25 monitoring data for radon within the Gravel

1	Gerties at Nevada Test Site?
2	MR. ROLLINS: No, I have not. Billy might be
3	able to
4	MR. SMITH: I don't recall that we took any.
5	MS. MUNN: Well, small program, small number of
6	people.
7	MR. PRESLEY: Right.
8	MS. MUNN: Small claimant base.
9	MR. ROLFES: Based on EPA maps of radon areas
10	and such, the soil type at the Nevada Test Site
11	would be similar to that in Amarillo, Texas
12	MS. MUNN: Yeah.
13	MR. ROLFES: and they're within the same
14	range.
15	DR. NETON: I was going to say 'cause we we
16	attempted to use those Gravel Gertie data from
17	Pantex at Iowa and we were not very successful
18	in doing that.
19	DR. ROESSLER: They're very different and
20	(unintelligible) get a space on the EPA radon
21	monitoring soil type thing.
22	MR. ROLFES: Iowa was much higher.
23	DR. ROESSLER: This sounds appropriate.
24	MR. PRESLEY: Okay, we finished up with 13 and
25	we're down to 14, which again has to do with

1	internal monitoring and again has to do with
2	comment five. Mark or Jim, what do we plan on
3	you know, with resolution five being done, I
4	don't think we have an action here.
5	
	DR. NETON: I'd agree with that.
6	MR. PRESLEY: Does everybody agree?
7	MS. MUNN: It appears to be covered by our
8	discussions in five.
9	DR. NETON: Yeah, we're talking about using the
10	Hicks data and mass loading model.
11	MS. MUNN: Correct.
12	DR. WADE: So how are you going to word that?
13	MR. PRESLEY: No action by working group right
14	now.
15	Now again, that's another thing
16	MS. MUNN: Pending.
17	MR. PRESLEY: (unintelligible) we're talking
18	about, pending that
19	MS. MUNN: Revision of Chapter 5.
20	MR. PRESLEY: revision of Chapter 5. But I
21	don't want to come back and revisit this the
22	next time we meet if Chapter 5 is not out.
23	MS. MUNN: Yeah.
24	DR. NETON: Good point.
25	MR. PRESLEY: Okay, 15, action, none. Has

1 anybody got any comments other than that? 2 We've -- resuspension of radionuclides 3 (unintelligible)? We've talked about that in 4 the past. 5 No, it's been agreed to. MR. PRESLEY: Okay, 16, same thing, it has been 6 7 agreed to. 8 MS. MUNN: We're done with that one. 9 INGESTION DOSES 10 MR. PRESLEY: Now, 17, ingestion doses. 11 More in the revision of 5. MS. MUNN: 12 MR. PRESLEY: Right. 13 DR. ROESSLER: And it says there's agreement --14 MR. PRESLEY: We also have an action on that 15 that when the model is approved and quidance to 16 the Chapter 4 revision. 17 MS. MUNN: Uh-huh. 18 MR. PRESLEY: Jim, have you got anything on 19 that other than -- than when Chapter 5 comes 20 out, look at it? 21 DR. NETON: Well, I'm looking at this ingestion 22 dose thing here real quickly, though. ingestion doses -- talks about the EPA model at 23 24 5 milligrams per cubic meter. 25 MR. ROLLINS: This is Gene Rollins. This was -

1 - and you see in the response there where we 2 were talking about the relative importance of 3 ingestion versus inhalation, and this would be related not to large particles but to 5 respirable particles. 6 DR. NETON: Uh-huh. 7 MR. ROLLINS: I provided some background 8 information here using some EPA-accepted 9 factors, and I think -- what I tried to 10 demonstrate was that the inhalation potential 11 dose far exceeds that that you would expect 12 from ingestion. MS. MUNN: 13 That makes sense. 14 MR. ROLLINS: Therefore --15 DR. NETON: But Gene, does the environmental 16 model have any ingestion dose pathway at all? 17 MR. ROLLINS: No. 18 This has been one of the DR. NETON: No. 19 problems we've had with many sites. Well, it 20 started with Bethlehem Steel, but you know, 21 it's recognized by most health physicists that 22 ingestion is a minor -- a minor route of 23 intake. But in some way it needs to be 24 addressed, even if it's just to dismiss it and 25 say that it's pretty small for what reason.

1 sounds like you've attempted to do that here in 2 your response. 3 MS. MUNN: I think all -- my interpretation is 4 that what's really needed is words with that 5 type of guidance going into the Chapter 4 6 revision. That's my interpretation. 7 incorrect? 8 MR. ROLLINS: This is Gene Rollins. Would that 9 be satisfactory, that I could put a 10 justification for not considering --11 DR. NETON: Yeah, I think so. 12 MR. ROLLINS: -- ingestion? 13 DR. NETON: I think if you can build that case 14 and put it in there and then -- you know, 15 'cause it's conspicuous by its absence. MR. ROLLINS: Okay, I can do that. 16 17 DR. NETON: To many people it's intuitive. 18 look at it and you've got ingestion pathway, 19 inhalation pathway and you need to address it 20 some way. 21 DR. ROESSLER: Give some relative numbers to 22 support it. 23 MR. ROLLINS: Right. Now this is just for the 24 fine particles that the -- the large particle 25 ingestion, that's another issue.

1 DR. NETON: Uh-huh. 2 MS. MUNN: Yes. 3 DR. NETON: Right. 4 MS. MUNN: Is that reasonable, Hans? Is that a 5 way to go? 6 DR. BEHLING: Yeah, I guess you wouldn't expect 7 people to be eating their lunch out there or 8 having deposition directly on their foods as 9 they're being consumed, so I would assume that 10 ingestion is a relatively minor pathway in 11 comparison to inhalation. 12 MS. MUNN: Yeah. 13 DR. NETON: I was going to suggest as one of 14 the overarching issues we are addressing the 15 ingestion pathway, but of course our main focus 16 is more for the manufacturing facilities, like 17 uranium operations. I'm not sure how directly 18 this would be applicable to NT-- our analysis 19 would be applicable to NTS, but --20 I'm not sure, either, but I feel MS. MUNN: 21 relatively sure that any time we find ourselves 22 faced with even a potential resuspension 23 problem that this same issue is going to arise 24 again.

Yeah. Well, we had had many

DR. NETON:

1 discussions with SC&A about the relative 2 magnitude of the ingestion pathway, and we've 3 been at odds. We've always maintained that it's much smaller than what the EPA models that 4 5 are out there would predict for like home 6 environments and such. And we'd be prepared in 7 -- I think January time frame that's also 8 wrapping up with -- EG&G is doing that analysis 9 for us, as well. 10 MS. MUNN: Good. 11 DR. ROESSLER: In home environments don't they 12 talk about children eating dirt 13 (unintelligible) --14 DR. NETON: Yeah --15 DR. BEHLING: (Unintelligible) --16 DR. ROESSLER: I can't imagine adult --17 DR. BEHLING: -- home -- home gardener 18 (unintelligible). 19 DR. ROESSLER: Yeah. 20 DR. NETON: Some of this EPA study is 21 interesting, but if you look at some of the EPA 22 studies that estimated ingestion per day, they 23 were relying on fecal samples. And they 24 completely disallowed any amount of the inhaled 25 material that was subsequently swallowed as

1 part of the fecal bolus that's coming out. 2 so in our opinion they've potentially 3 overestimated significantly the amount that's 4 just ingested from pure contact of hand to 5 mouth type situation, and we're looking at that 6 very closely. I hope to find some data --7 we've just found some more recent data on 8 simultaneous measurements of fecal in ura-- in 9 urine for uranium workers. That would give us 10 some handle on what's coming out with the 11 various pathways. If you knew what the 12 inhalation was, you could sort of infer the 13 ingestion. 14 MS. MUNN: It would really be helpful if by the 15 January meeting you could work that out with --16 DR. NETON: We hope to. 17 MS. MUNN: -- SC&A and get --18 DR. NETON: That's why the final resolutions of 19 the Bethlehem Steel -- the Bethlehem Steel 20 profile has been done. We reissued it, but we 21 all agreed that was an overarching issue and we 22 would address that on the side, and that's one 23 of the issues that (unintelligible) --24 MS. MUNN: Right.

DR. NETON: -- comes up.

1	MR. PRESLEY: It'd be interesting to see.
2	MS. MUNN: Yes.
3	DR. NETON: We do a lot of interesting work
4	behind the scenes.
5	MS. MUNN: It's really helpful to get that put
6	to bed.
7	MR. PRESLEY: Okay, 18.
8	MS. MUNN: Now on to more Chapter 5 stuff.
9	DR. ROESSLER: It says no further action, and
10	SC&A agrees with NIOSH's response.
11	MS. MUNN: Then
12	MR. PRESLEY: Anybody have any problems with
13	that? No action.
14	MS. MUNN: And then (unintelligible) is done.
15	Right? Evaluation is complete. Discussion
16	included in the revision. We're done.
17	DR. BEHLING: Did this take into account some
18	of the recent work that was published by
19	well, I guess (unintelligible) for DTRA
20	what's the names? It was just recent article
21	on this (unintelligible).
22	DR. NETON: Yeah.
23	DR. BEHLING: God, I worked with him out in the
24	Marshalls. He works for the CIC*. But he came
25	up with some relationship between

1	DR. NETON: Right.
2	DR. BEHLING: beta and gamma doses, and they
3	can be as high as 100 to one, and I'm not sure
4	whether or not that was
5	DR. NETON: I doubt that that was included
6	'cause that just came out within the last
7	DR. BEHLING: Yeah. Yeah, it just was
8	published in the last Journal or the one before
9	that.
10	MR. PRESLEY: Okay, so we can say 19's
11	complete? (Unintelligible) about that?
12	MS. MUNN: (Unintelligible). They had somewhat
13	of a different circumstance in the Marshalls
14	than (unintelligible), but do you think it's
15	applicable?
16	DR. BEHLING: Well, I'm not so sure it's all
17	that different. The atmospheric tests there
18	and certainly a higher magnitude, but the
19	ratio between beta and gamma probably is not
20	too different.
21	MS. MUNN: It says here the resolution included
22	development of time-dependent beta/gamma ratios
23	and procedures out for estimating the pre-1966
24	time period, so
25	DR. ROESSLER: Is it Neil Neil Barrs*?

1 DR. BEHLING: Neil Barrs. 2 DR. ROESSLER: That was in the --3 DR. NETON: Yeah, I was trying to come up with that. DR. BEHLING: Yeah, I was just 5 6 (unintelligible). 7 DR. ROESSLER: -- October issue. 8 MR. PRESLEY: All the stuff that was pre-'66 9 was for above-ground, which I can see what Hans 10 says there about the Marshall Islands. 11 know, it -- you -- you -- everything's above-12 ground there and everything's above-ground 13 prior to '66. 14 MS. MUNN: You think there's a possibility it 15 might change the time-dependent ratio that 16 (unintelligible) develop here? 17 DR. BEHLING: I think he also has a time-18 dependent relationship. In fact, it's also --19 he probably fine-tuned it in the most recent 20 Health Physics article, but he also published 21 in The Green Book, which was the DTRA manual. 22 I think you'll see the same tables there. 23 MR. CLAWSON: Doesn't it say here that NIOSH 24 will issue a procedure for establishing this, 25 but there's nothing -- there's nothing left for

1	the working group. But how do we tie that up
2	that
3	MS. MUNN: Well, it's done
4	MR. PRESLEY: The evaluation's been completed
5	and discussions included in the Chapter 6
6	revision. But now are you all going to do
7	anything further than that with this new
8	MS. MUNN: Well, that's the question. Hans is
9	raising the question should (unintelligible)
10	DR. BEHLING: Yeah, I haven't
11	MS. MUNN: report be
12	DR. BEHLING: It should at least be looked at -
13	-
14	MS. MUNN: looked at.
15	DR. BEHLING: and see, you know, how how
16	does that compare to to what is being
17	proposed here.
18	DR. NETON: I think that's reasonable.
19	MR. PRESLEY: Can we say then that NIOSH will
20	look at
21	DR. NETON: Are you following that, Gene?
22	MR. ROLLINS: I'm not sure that I am.
23	DR. NETON: Well, there's an article that just
24	came out in the October issue of <i>Health Physics</i>
25	that dealt with these time-dependent beta/gamma

1 ratios by Neil Barrs, and Hans is suggesting we at least need to look at it to see if it's 2 3 consistent with what -- what has been developed 4 by us. 5 MR. ROLLINS: Well, was this specific to the NTS situation? 6 7 DR. BEHLING: Not to NTS, but these were done 8 in behalf of the DTRA dose reconstruction 9 project involving the Pacific Proving Ground, 10 but certainly they're comparable. 11 MR. ROLLINS: Yes, I would think so. It seems 12 to me -- yes, that report has been reviewed and 13 our revision is reflective, but I do remember 14 now because I didn't work on that directly. That was Jack Fix and Dick Griffith worked on 15 16 that, and I do remember them passing the Barrs 17 report back and forth. 18 DR. NETON: Okay. 19 MR. ROLLINS: So in fact I think that's what 20 they used. DR. BEHLING: 21 Okav. 22 MS. MUNN: Oh, that would be good. Well, if 23 you could verify that, then there would be no 24 further action. 25 MR. ROLLINS: In fact you just gave -- I just

1	learned what that Barrs report was because I
2	didn't know what it was, but now you've filled
3	me in, so that's good.
4	DR. NETON: There's probably a Barrs report
5	that ended up becoming the <i>Health Physics</i>
6	publication.
7	DR. BEHLING: Yeah, it's in The Green Book as
8	well.
9	DR. NETON: If it's The Green Book then we've
10	got it.
11	MS. MUNN: So do we have an action or not?
12	MR. PRESLEY: Well, I put down here NIOSH will
13	look at the beta/gamma ratios and I'm going to
14	put down they can report back to us that it's
15	been that it's in the data that they're
16	using.
17	MS. MUNN: That the latest report
18	MR. PRESLEY: Yeah, that the latest report
19	(unintelligible)
20	MS. MUNN: (unintelligible) significant
21	differences.
22	MR. ROLFES: We did use the DTRA document, but
23	I'm not certain if it's the one published in
24	recent
25	DR. NETON: You can check that.

1	MR. ROLFES: but we can just verify that
2	very simply.
3	MS. MUNN: Okay.
4	MS. SMITH: This is Cheryl. Actually Griffith
5	went to the Hicks data and developed his
6	beta/gamma ratios from that data. It's it's
7	very comparable it's not identical, of
8	course with information in the Barrs article
9	or the Barrs document.
10	MS. MUNN: Well, I would hope we'd only be
11	looking for major significant differences. And
12	if there are no major significant differences,
13	then I can't see an issue.
14	MR. PRESLEY: Okay, is everybody happy with
15	that?
16	MS. MUNN: That won't take a significant
17	commitment, will it?
18	MR. PRESLEY: I would not think that it would.
19	You seem to think that it's just a matter of
20	asking a question.
21	MR. ROLFES: I think we could have a couple of
22	questions and get it resolved.
23	MS. MUNN: Good.
24	MR. PRESLEY: Twenty, there appears to have
25	been

1	DR. NETON: This is the same
2	DR. BEHLING: (Unintelligible) interesting
3	DR. NETON: This is the same as 11(d). Can we
4	consolidate these somehow so that we don't keep
5	having these recurring
6	MR. ROLFES: I might be able to do that if it's
7	all right with the Board.
8	MR. PRESLEY: That'd tickle me to death. I'm
9	going to put a note up here that this will be
10	consolidated.
11	DR. ROESSLER: And we now know what statistical
12	methods are being used, so end of this
13	issue.
14	MR. PRESLEY: Twenty-one, TBD does not contain
15	information about internal or
16	DR. ROESSLER: Extremity.
17	MR. PRESLEY: extremity dosimetry. We
18	marked the action complete on this. Anybody
19	have anything else?
20	MS. MUNN: Done. Right?
21	DR. ROESSLER: Right.
22	MS. MUNN: Similarly, comment 22.
23	MR. PRESLEY: Twenty-two, there are no new
24	(unintelligible) data of 1966 and we've got
25	that marked action complete.

1	MS. MUNN: We've agreed on all those ratios,
2	and it's been incorporated into the guidance.
3	Right?
4	MR. ROLFES: Gene
5	MR. PRESLEY: Still waiting on Chapter 6
6	revision to come out. That's got to be done.
7	Am I am I correct on that?
8	MR. ROLFES: That's correct. Gene, you have
9	incorporated this into the latest revision and
10	you are just waiting to send it to NIOSH for
11	final review. Correct?
12	MR. ROLLINS: That's the response to 22?
13	MR. ROLFES: Yeah.
14	MR. ROLLINS: Is that what we're discussing?
15	MS. MUNN: Correct.
16	MR. ROLFES: Yes.
17	MR. PRESLEY: Yes, sir.
18	MR. ROLLINS: Yes.
19	MR. PRESLEY: Twenty-three do we have any
20	further discussion on 22?
21	(No responses)
22	Twenty-three has to do with response five
23	again.
24	MS. MUNN: Yeah.
25	MP PRESIEV. Also has to do with Chapter 4

1 revision, resuspension of doses. 2 MS. MUNN: No further action by us. 3 MR. PRESLEY: Is that acceptable? 4 MS. MUNN: Waiting for the train to come in. 5 MR. PRESLEY: Going to be doing a lot of 6 reading, I can see, when that does come. 23 (b) 7 the same thing? Make sure -- nobody has a 8 problem with that. 9 MS. MUNN: No, model's approved. We do have 10 the model approved. Right? Or do we? Is the 11 model approved? 12 MR. ROLFES: The resuspension model? 13 DR. NETON: No. 14 MR. ROLLINS: This is Gene Rollins. No, we're 15 going to develop the model with the 16 justification and provide that to the Board. 17 That's an action for us. 18 MR. PRESLEY: Okay. Is that going to be done 19 in December or are you looking at that in 20 January? I didn't mean to put you on the spot. MR. ROLLINS: Well, I don't want -- it won't be 21 22 just myself doing this so I -- and I hate to 23 commit other people before having even talked 24 to them about it. I think it would be 25 reasonable to think that we could get something

1 done in December, but I really would be 2 hesitant to commit to that time frame. 3 MR. PRESLEY: Okay. That way Lew can hold a 4 place on the -- on the table for it. 5 DR. WADE: That's right, I can. MR. PRESLEY: Okay. Anybody else have anything 6 7 else? 8 MS. MUNN: Nope. 9 HIGH-FIRED OXIDES 10 MR. PRESLEY: Twenty-four, the presence of 11 high-fired oxides. We'll be talking here till 12 tomorrow. 13 DR. NETON: Well, not necessarily. 14 DR. BEHLING: Is there any reason to assume 15 that you don't have super S? 16 DR. NETON: No. 17 DR. BEHLING: I mean given -- given the high 18 temperatures. 19 MS. MUNN: It says Mark was going to verify. 20 DR. NETON: I can tell you that I've measured 21 plutonium in a lot of samples that came from 22 fallout and they're pretty insoluble. You had 23 to go to sodium pyrofluorate* fusion -- sodium 24 fusions to get those things in solution, so I

think the case is that there are -- there are

1 super S and our -- this OTIB, whatever it is, 2 50 -- I can't remember the number right off --3 MS. MUNN: Was it 52? 4 DR. NETON: The TIB that's going to deal with 5 the super S is going to be applicable complex-6 wide, with certain caveats. I quess one could 7 arg-- one could speculate as to whether it's 8 even more insoluble than the super S that we've 9 seen at other locations, but --10 MS. MUNN: Well, we can take off the words that 11 say Mark's going to verify that. We can say 12 the OTIB in progress is complex-wide. 13 DR. NETON: Yes, it will be. Again, given 14 certain caveats. It wouldn't necessarily be 15 applicable to the ceramicized plutonium 16 particles at Los Alamos, but... I think it 17 would be hard -- we'd be hard-pressed not to 18 consider these to be super S plutonium. 19 That was easy, Mark. 20 MR. PRESLEY: Twenty-five -- yeah, it was a 21 whole lot easier than I thought it'd be. 22 MS. MUNN: How far -- how are we doing with 23 that OTIB with that high-fired super S stuff? 24 DR. NETON: I want to say that it's done, but 25 it hasn't been signed by -- I haven't signed it

yet, but the last I heard it was -- we'd come to resolution with SC&A on all of the models and such. I think we are waiting -- well, we weren't going to wait for the final revision -- review by SC&A, which was Joyce Lipsztein and others looking to see if they could find cases in -- that were more refractory, more insoluble than our so-called design case we chose.

MS. MUNN: But even if they do, that will be -DR. NETON: It would be a modification and it
will be incorporated, but the nuts and bolts of
the proce-- the OTIB are done and --

MS. MUNN: So the heavy lifting's over with and

DR. NETON: Oh, yeah.

MS. MUNN: -- you're just polishing now, good.

SITE EXPERT REVIEWS

MR. PRESLEY: Item 25 deals again with the documentation of site expert reviews, and it brought to our attention that SC&A was not getting some of the reviews. And I was wondering where -- have we been able to get them what they've asked for -- all except the classified stuff?

MR. ROLFES: Gene, have we provided any

1 additional interview notes to SC&A or have you 2 sent me anything recently --3 MR. ROLLINS: I'm going to -- we -- what we did, we collected all of our interview notes, 4 5 all of our recollections -- it was really a 6 quite extensive list, and all of our e-mails 7 and everything, and what we have done -- and I 8 don't know what the status is, but we were sending those out to a derivative classifier at 9 10 the Nevada Test Site to get the okay to 11 distribute those. That was our instruction, to 12 do that. And I don't know where we are in that 13 process right now, but I will find out and get 14 back to you. 15 MS. MUNN: Good. 16 MR. ROLFES: There were also -- Gene, there 17 were also some interview notes from SC&A I 18 believe that we were requesting. Is that not 19 true? 20 If they have some that they would MR. ROLLINS: 21 like to share with us, I think that would be a 22 good thing. 23 DR. ROESSLER: I remember that coming up at a 24 meeting (unintelligible) --25 MR. ROLFES: I think we had requested that and

1 we have yet to receive those, as well, from 2 SC&A. 3 MS. MUNN: And I thought there were going to be 4 some internal phone conversations about --5 MR. ROLFES: Yeah, I haven't received them. haven't been -- that hasn't been followed up, 6 7 so... 8 DR. WADE: Why don't -- then maybe you could 9 call Arjun --10 MR. ROLFES: Uh-huh. 11 DR. WADE: -- I mean there seems to be concerns 12 on both sides, so I mean let's just work it out 13 and swap stuff. 14 MR. PRESLEY: That's what I'm going to put 15 here, interview notes are in the hands of the 16 DC at NTS and NIOSH also has not received notes 17 from SC&A, and then I'll put a note here that 18 Mark will get with Arjun. 19 MR. SMITH: Hey, Gene, this is Billy. Did you 20 see the interview that I did with SC&A? 21 MR. ROLLINS: I don't believe I have. MR. SMITH: Tom Bell took my -- some --22 23 interviewed me about two years ago, so that's -24 - that's something that's in their hands that 25 you haven't seen.

1 DR. BEHLING: (Off microphone) (Unintelligible) 2 MR. PRESLEY: Does anybody else have anything 3 about the 25 issues -- Mark? -- that you want 4 to bring back up? Jim? Hans? 5 (No responses) One of the things that I would like to bring up 6 7 on the table is do we have a list of items that 8 are specific to all sites that we're looking 9 into right now? 10 DR. NETON: Yes, we're compiling that. 11 MR. PRESLEY: Okay. Okay. 12 Brant Ulsh came back from the DR. NETON: Nevada Board meeting with a list that you guys 13 14 started, and he's polled the health physicists 15 for other issues that should go on that list, 16 so we've expanded it some. So we do have that 17 list available and that's the list that we'll 18 speak from at the next Board meeting as to the 19 status on where we are with these things. 20 That will be so helpful. MS. MUNN: 21 MR. PRESLEY: Brant brought a concern up about 22 we've -- we've got here no action required, no 23 action by the working group, but we have all of 24 the data that's not complete on Chapter 2, 4, 5

and 6, I believe, and when that comes out we

want to set down and really go through that with you all, and I guess Arjun, and make sure that we've covered all those things and we're not going to get down -- two or three meetings down the road somebody snakebite us.

MR. CLAWSON: Everything's pending on that.

MS. MUNN: I hope we don't have another two or three more meetings. I hope we're getting real close to the point where we --

MR. PRESLEY: I do, too, but I mean -- what I'm talking about going af-- after we do this and say yeah, the site profile -- you know, we make a recommendation to accept or delete, whatever it be, but I'm talking about down the road from that somebody come back and say oh, you all didn't do this. That -- I want to make sure that we cover all the bases on this so that doesn't happen. This one's been not as complex as some, but it's been quite complex.

MS. MUNN: Well, if we cover the bases that matter, then that's really and truly the best I think anybody can do. There's always going to be some minor detail somewhere that can be worried out of the matrix.

DR. WADE: But I think Robert's point -- and I

think it's a generic one that -- let's say that we come to a very knotty issue, there's good discussion, there's agreement intellectually that a certain action will happen and then we remove it from the list. There needs to be some follow-up to see that that action happens. And that's something that we -- NIOSH I think have to be prepared to offer to the Board. This is following on beyond the action of the working group to see that those commitments are actually followed up upon and in the way that was agreed upon. So I mean I think that's something that we need to, at this December meeting, talk about as well, what's the mechanism for that.

MS. MUNN: I hope so. I would hope that it would become a standard part of our agenda so that, just as we see our caseload changing from meeting to meeting, we would also see the action items -- the outstanding action items changing as well.

MR. CLAWSON: This may not be the time or the place, but something that's been bothering me that I've started to see pop up is -- let's take like Los Alamos, the lanthium (sic), I

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MS. MUNN: Uh-huh, lanthanum.

DR. ROESSLER: Lanthanum.

MR. CLAWSON: Okay. Now they were covered for that, but it's interesting because where was that processed at, where was that manufactured at? Are we looking at what came into this? And so I've dug into a little bit of it. It was Idaho, and that doesn't even show up in our TBD, so one of the things I want to kind of see is when we do find these -- these oddball things, that we trace it back so that we can't get beat on later of -- here you covered it at Los Alamos and where it was manufactured and produced was -- it doesn't even show into the technical database. And somehow I'd like to be able to keep track of that the same 'cause we've got many sites, and each one of these sites are unique in several aspects. But when we find these -- I guess the term's wrong, but oddball little issues like this, we come to find out where they came from and make sure that they're addressed, that that's in the profile, too.

DR. WADE: That's obviously a valid point. I

1 mean do we want to put that on the agenda for 2 the next meeting? I mean this is sort of 3 tracking beyond a facility, sort of the birth to death realities of certain materials. I 4 5 mean do -- I don't know, what's our -- do we do 6 that? Do we look at... 7 DR. NETON: I think we do it. We haven't 8 formalized that process at all, though. I'm 9 wondering if this wouldn't be something to put 10 on the overarching issues list just to -- as a 11 placeholder at this point to --12 DR. WADE: Can you put it -- can you see that 13 it goes on the list? 14 DR. NETON: I'll put it --15 DR. WADE: I mean that list will be brought up 16 before the Board in December. 17 DR. NETON: Right. It may not be a perfect 18 spot for it, but my thinking is --19 MR. CLAWSON: Well, and I'm trying to figure 20 out how to put it, too, because I've seen some 21 of these overarch -- these issues appear with 22 Savannah River, certain oddball things, and 23 they came out of Y-12 I believe it was. All of 24 these sites are intertwined uniquely --25 DR. NETON: Oh, yeah.

1 MR. CLAWSON: -- from certain different little 2 processes. 3 MR. PRESLEY: Especially your production sites. MR. CLAWSON: Right, and I've -- I've just seen 4 5 that these things come up and we cover it at 6 one site, but we never take where it came from. 7 And lanthium (sic) was the interesting one to 8 me because --9 MS. MUNN: Well, it surprises me that you 10 didn't find any indication of it, though. 11 It's not in -- well, and --MR. CLAWSON: 12 that's a pretty big site profile that I've been 13 going through on -- just Idaho, and in going 14 through it I hadn't seen anything on it. Now 15 there may be a little blurb or something that I 16 missed. But see, this was part of the process 17 and I want to make sure that we're covering --18 MS. MUNN: Yeah --19 DR. NETON: That's an excellent --20 MS. MUNN: -- that's an excellent point, but 21 the other point that goes along with that is 22 that it may or may not be significant on one 23 site, but might be quite significant on another 24 and that there's an obvious connector 25 (unintelligible) --

1 MR. CLAWSON: Well, and the way I found into it 2 was this was produced by the NTR reactor, which 3 only found four people that even have knowledge of it and they pulled this out of the reactor, 4 5 super fast, put it in and shipped it because of the very short half-lifes. 6 7 MS. MUNN: Hot stuff needed to get to where it 8 was going. 9 MR. CLAWSON: Right, and -- and it didn't -- it 10 didn't show anything like this, and I just want 11 to make sure that we're covering our bases on -12 13 MS. MUNN: Yeah. 14 MR. CLAWSON: But I don't know where to bring 15 it up and I apologize if this is the wrong 16 place. 17 DR. WADE: No, this is it --18 MS. MUNN: This is the right place. 19 DR. WADE: -- you put it in the list, then I 20 would ask you, when that list is up there, then 21 you need to embellish the point and --22 MR. CLAWSON: Okav. 23 DR. WADE: -- and then the Board could decide 24 in various ways to deal with it. It could ask 25 NIOSH to do it. It could ask SC&A to do it.

1 They could form a working group. I mean there 2 are vario-- I mean this is sort of a continuity 3 issue --4 MS. MUNN: Yes, it is. 5 DR. WADE: -- around the complex. It makes 6 sense. 7 MR. CLAWSON: Well, we've seen it with so many 8 sites, we're -- we're all intertwined. 9 sits there with Y-12, it's got almost something 10 from every one of these sites. And how it got 11 there, it's sometimes -- it's an unknown. just all of a sudden appeared, you know. 12 13 DR. WADE: You think? 14 MR. CLAWSON: Yeah. Yeah, I'm sure there's 15 documentation, though, at -- somewhere. 16 DR. WADE: Well, I think that's an excellent 17 point. 18 MS. MUNN: Yes, it is a good point. 19 DR. WADE: So not only is this working group 20 sort of doing its work on Nevada Test Site, but 21 you're also sort of blazing the trail in terms 22 of overarching issues and tracking, and I think 23 those are things that we really need to focus 24 more on -- now that we have stuff to track. 25 The other issue, to make it more complex as it

relates to SC&A, is that if NIOSH says we're going to do -- there's an intellectual agreement and NIOSH says we're going to do this, then one question is was that done, and then does the Board want its contractor to review what was done to see that it has met the spirit of that agreement. Or does the Board want to do that or do you want closure not only in terms of checking a box, but in terms of looking at content. And you know, that's something the Board can take up when we have these discussions.

MS. MUNN: That would be a second tier issue for the Board.

MR. PRESLEY: We might be able to go back -the item that Brad's talking about may have
already been addressed by ORAU in some of their
data mining, so to speak, about what
radionuclides and what materials are on each
one of the sites. It may be, Jim, that -- Mark
-- one of you all need to ask ORAU by chance
has that been done, and it may have been.
'Cause we used to -- one of the things that we
used to do at Y-12 was every year you had to
report to a DOE oversight committee the

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chemicals that you had on site. And that list was very, very extensive 'cause I was the person at Y-12 that did it the last two years before I retired. And I think that this -- it may be easier than we think. Now it may be harder to check it --

MR. CLAWSON: Well, I know that the chemicals -- because you've got a chemical database that you're tracking, and they did a really good job on that. And I just have to take from my personal experience, I was told up until 1995 that we had no plutonium in the raw uranium. Okay? So that -- you know, that brings up -that brings up the issue until we had for -that they classified as positive -- false positive, and now all of a sudden -- we all that have been involved with this know that plutonium is a natural byproduct and there always is going to be some there. So I just want to make sure that we're covered on this and maybe track -- as we get into these issues, I'd like to look at that and maybe we could discuss it more in December and go from there.

DR. WADE: I think it's an excellent suggestion.

1 MR. PRESLEY: (Unintelligible) something to me 2 needs to be done. 3 DR. WADE: It does. I mean it's sort of what 4 you would expect, as this program matures, that 5 you would start to have the intelligence and the time to look at some of these sort of 6 7 broader issues, and look for some continuity 8 within the system, where there should be 9 continuity. 10 MR. CLAWSON: Well, as a new person coming on 11 to this, what has really surprised me about everything is how all these sites are 12 13 intertwined with one another, in many different 14 aspects and in many different programs, bits 15 and pieces and so forth like there, and I just 16 want to make sure we're covering this. 17 MS. MUNN: Thank you. 18 Anybody else have anything else? MR. PRESLEY: 19 DR. WADE: I'd like to thank the workgroup 20 particularly for making the effort, and I think 21 it was a productive day on many levels --22 MS. MUNN: Yes. 23 DR. WADE: -- not only the Nevada Test Site, 24 but also these other things. And it's 25 wonderful to see Jim back at the table and --

1 MS. MUNN: It sure is. 2 MR. PRESLEY: What I want to say, it's good to 3 see Jim back, and I want to thank Mark for all of his work because I know he's pushed to get 5 this done. And Jim, than you for being here 6 and adding your expertise. 7 DR. NETON: Good to be back. I appreciate the Cincinnati 8 DR. ROESSLER: 9 people for coming to this hotel so those of us 10 who travel don't have to go all the way down to 11 your offices. 12 MR. PRESLEY: Yeah. 13 MS. MUNN: Yes, very much appreciated. 14 all I can do to get here from the airport, much 15 less back across the river and up to NIOSH. 16 DR. WADE: While we're passing out thanks to 17 Hans for making the trip. Obviously you must 18 be a bit under the weather. You seem to be --19 DR. BEHLING: Well, I've got this beautiful 20 case of oak poison over the weekend so that's why my face is just -- you know, I just feel 21 22 like -- it's torture on my face and I hope 23 (unintelligible) is working a little bit here. MS. MUNN: I hope so. 24

DR. WADE: So we doubly appreciate the effort.

1 It's always a pleasure when you join us. DR. BEHLING: Yeah, I was cutting down trees 2 3 and I know I'm very, very allergic to poison 4 ivy and oak. I was wearing gloves, but I got a 5 lot of sawdust in my face and I just wiped my face with the gloves that must have had some 6 7 poison on it and I know better than that. 8 What can I tell you, it says it all. 9 MS. MUNN: (Unintelligible) try to keep you 10 from contaminating yourself. There you go. 11 Thank you all. Travel safely. DR. WADE: 12 MR. PRESLEY: Thanks to everybody. 13 DR. WADE: Thank you on the phone for your 14 contribution. MR. ROLFES: Thank you, Gene, Cheryl and Billy. 15 16 MR. SMITH: Okay, Mark. 17 DR. WADE: The Board will next begin its 18 activities at 10:00 tomorrow morning with a 19 subcommittee meeting, and you all are welcome 20 to join. 21 (Whereupon, the meeting concluded, 1:45 p.m.) 22

CERTIFICATE OF COURT REPORTER

STATE OF GEORGIA COUNTY OF FULTON

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of November 15, 2006; and it is a true and accurate transcript of the testimony captioned herein.

I further certify that I am neither kin nor counsel to any of the parties herein, nor have any interest in the cause named herein.

WITNESS my hand and official seal this the 7th day of January, 2007.

STEVEN RAY GREEN, CCR

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102